Smithsonian

February 1982

A cactus flower blooms
at The Huntington,
a garden for the mind (p. 64)

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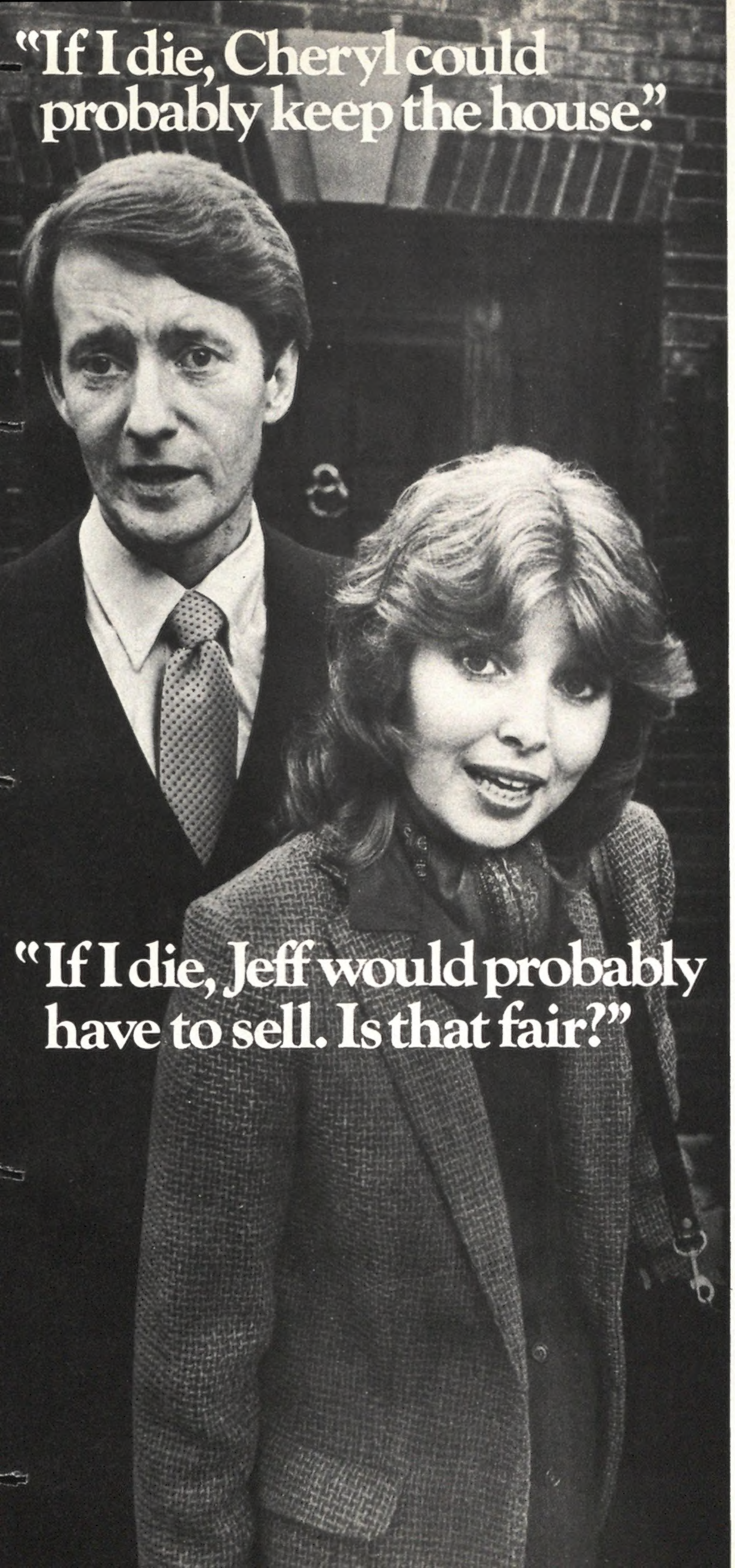

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February 1982

Smithsonian

Volume 12, Number 11

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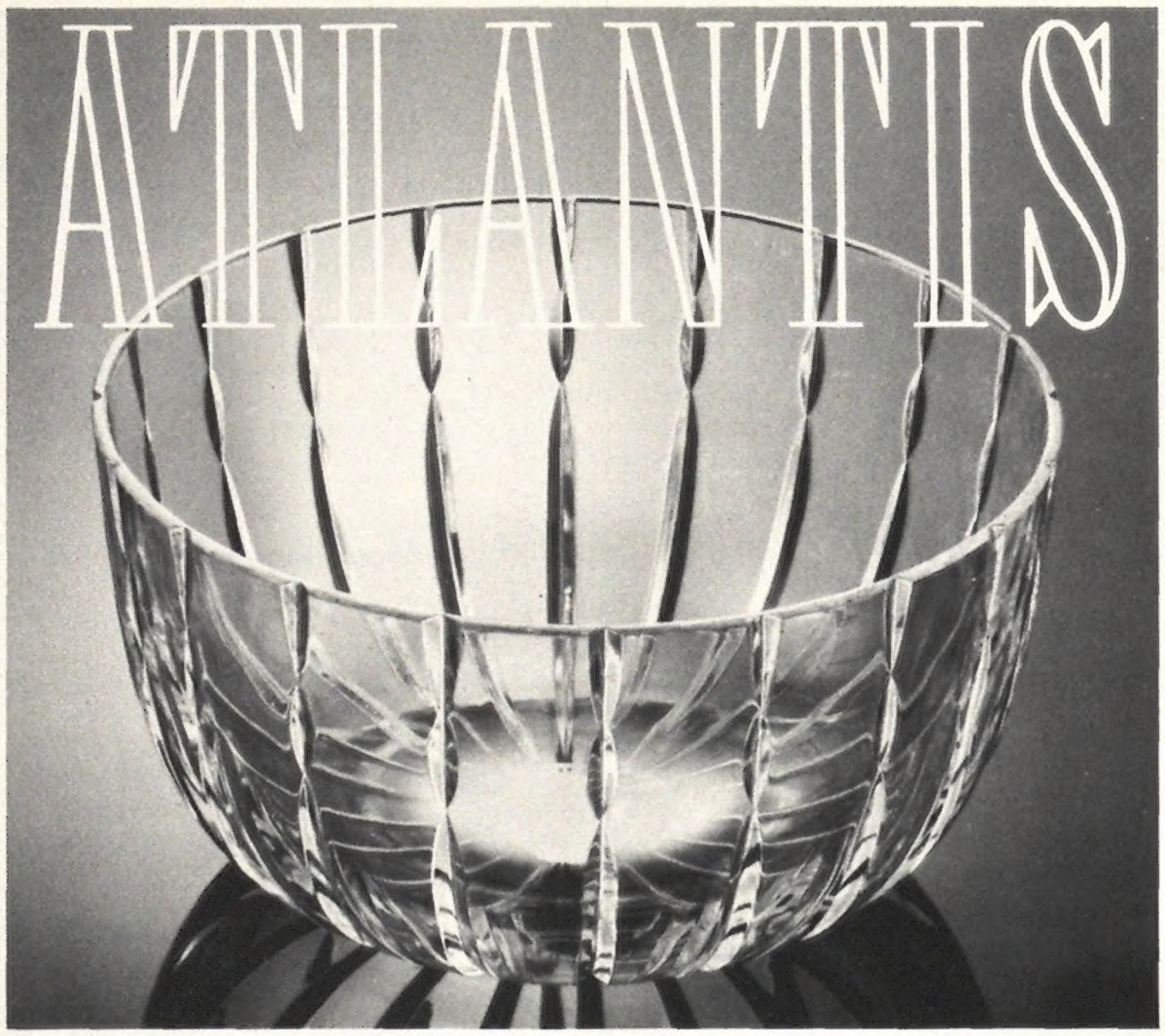

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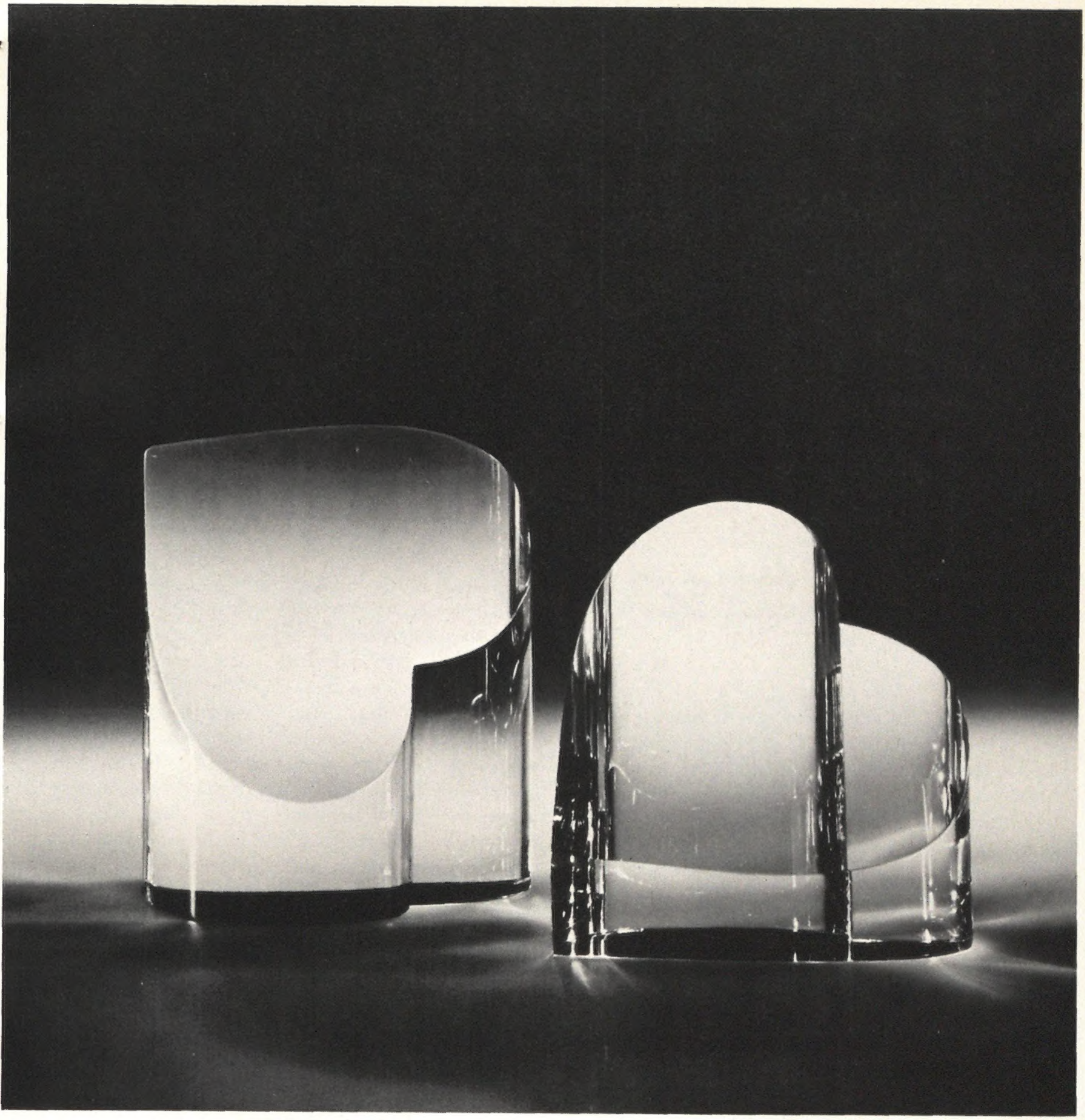

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Secretary Ripley's comments

The view from the castle

A natural history expedition may offer adventure—but only hard work and precise records can add to the sum of knowledge

Planning an expedition to a remote and mountainous part of southern Asia—in my case, to Arunachal Pradesh in extreme northeastern India—is still much as I remember it from years ago. To be sure, there are some differences. Air travel is now axiomatic, where it used to be a long haul by boat. But many of the things that need to be planned, provided for, sent ahead or taken along, have not changed that much.

First, there are the tents, which were made for us. Then there is the question of food. Nowadays a great deal of weight can be saved by using freeze-dried meals in foil envelopes. The results are about as tasty as wartime army food—C rations, for example—but it is still infinitely lighter and handier than cans. If then the folding tables for work, the canvas chairs, the pressure lamps and kerosene, the cooking utensils and bedding, not to mention clothes, are included, the sum total of equipment for basic living needs alone is formidable.

Added to this must be technical supplies. Alcohol, formalin, jars, plastic containers, specimen preparation and study equipment, trays, insect traps (now including special night lamps), perhaps gas-fogging equipment for treetop collecting, nets, litter-layer sorting devices for cryptic animals on the forest floor—all may be brought along by the natural history specialist. Insects as a class are the least known to cataloguers of living creatures, the least inventoried. New species are still being found in the tropical forests of the world, often high in the forest canopy, sometimes buried in the leaf mold or layers of debris underfoot. It is probable that species unknown to science still outnumber those that are known. Their presence or absence tells much about the health and composition of these forests.

And so to travel into an unknown corner of tropical forest or mountains in southern Asia today, or in some remote recess of the tropics of the Western Hemisphere, is still as much of an adventure in logistics as ever. Of course, some of the roads may be better, but even these tend to peter out eventually, and going by foot or, with luck, by canoe, pony, mule or yak, may be the answer. Even elephants are in current use in southern Asia. And human help in the form of porters or carriers is essential, especially for Westerners.

It is dirty, slogging work, most of it, but the rewards can be noteworthy, photography not least among them. At the heart of all natural history exploration, however, there still must be verification, and that means specimens. Reality in natural history is confirmed by accurate measurements, notes on color and texture, as well as by records of life history and growth characteristics. For this there must be solid documentation, not hearsay. The world is a vast data bank of animate things, and to retrieve the information we require reference specimens and precise, recorded observations in each case.

Such concrete and verifiable records continue to be amassed and to be critical to human knowledge, despite the too-easy assumption that all of the planet, its every nook and cranny, and every living thing everywhere is known. And so we are going off to a remote part of India to observe insects and birds, and perhaps, we hope, to add to that knowledge.

S. Dillon Ripley

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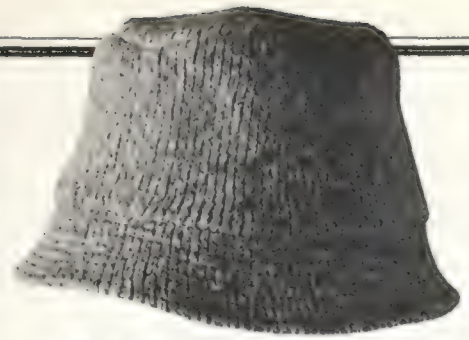

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Letters to the Editor

Minnesota zoo

Dear Sir: I find the cover picture of the Japanese macaque mother and baby on your December issue both appalling and offensive in the context of the Christmas season. Hopefully the choice of subject reflects mere editorial visual insensitivity and not a deliberate attempt at parody.
Patrick C. Mizelle
Atlanta

Dear Sir: That December cover is a classic that is most fittingly appropriate to the time of year. I wonder if others got the impression it made on me of the universal kinship of all living creatures as typified by this simian madonna and child.
Owen J. Remington
Lancaster, Virginia

Mongol armada

Dear Sir: Perhaps the Mongols did indeed stink, as Mr. Saar claims, but they hardly "stank of kumiss, the rancid mare's milk that provided the basis of their simple diet." The fermented mare's milk product called kumiss is no more rancid than is the fermented grape product called wine. In fact, kumiss smells and tastes rather like a dry sherry.
Gary Jennings
Mexia, Texas
According to the Department of Agriculture, anything fermented is technically rancid. One foreign service officer, served kumiss in Asia, says, "It tasted terrible, sour and heavy. The only kind of sherry I could imagine it resembling would be rancid sherry." Ed.

Mormon genealogical library

Dear Sir: I have been doing family research for some time, and learned of the work of Mormons some eight or ten years ago. I'm a lover of "junk stores" and antique shops, and I've been in a lot of them. Almost every one has a box of old photographs. I go through them and buy only those in which the people are identified. I then package them neatly and mail them to the Mormons.

Often as not, an old shabby Bible will be somewhere in the store. If it is pre-1850, falling apart and real cheap, I remove the family history, copy the front page and all other inscriptions. If the Bible is too good to dismantle, I copy the record, even mistakes in spelling, give the dealer a dollar and send off the copy.
Mrs. Mae Noell
Tarpon Springs, Florida

Tower of time

Dear Sir: The beautiful foldout is the best example I have seen depicting the evolutionary concept of origins. But why do men of science persist in mixing fact and fiction and boldly presenting the composite as an undisputed, proven fact of life? It is exhibits and articles such as this that foster the myth of evolution. Artists' conceptions and repeated presentations do not make an idea true. No matter how good your imagination is, the missing links are all still missing. If the animals that you believe must have existed but have no proof of were removed from the drawing, you would have reality, a series of distinct, unrelated life-forms. Please let your readers know that evolution is still disputed.
Gary D. Bombard
South Glens Falls, New York
The column shows the succession of animals and plants through time, the only hypothetical organism being the "leaping link" between reptiles and birds. All named organisms are well known from the fossil record. Ed.

Dear Sir: John Gurche's time column is beautiful and fascinating. I find myself poring over its details, and I'm sure children would, too. Is it possible to get a poster-sized copy to hang in my school?
Katherine Lawrence
Quincy, Massachusetts
A full-color poster of the tower of time is

BMW. ONE OF THE FEW CAR COMPANIES NOT CURRENTLY INTRODUCING IMITATION BMW'S.

The annual new-car introductions have ushered in cars so strongly resembling BMW's as to suggest new meaning for the term 'coincidence.'

And a good many of these newcomers claim to perform 'like' a BMW.

This sudden enthusiasm for BMW-like performance is rather amusing.

Because while it's possible to develop enthusiasm virtually overnight, the development of engineering takes considerably longer—a fact that's amply demonstrated by the BMW 320i.

THE BMW 320i VS. UNREASONABLE FACSIMILES.

The 320i is engineered according to a belief that hasn't changed for decades:

Namely, that performance is, and will always be, the ultimate measure of a car's worth—a belief that permits a car to grow by gradual refinement, instead of hasty responses to changing fashions.

The current preference for leaner, more efficient engines, for example, has caused no radical reshuffling of priorities at BMW. The 320i is powered by a 1.8-liter engine equipped with K-Jetronic fuel injection—and has been for years.

Nor has the 320i needed any instant re-engineering to deliver better mileage. It delivers an EPA-estimated 25 mpg, 36 mpg highway, figures that would be respectable even in an economy car.

(Fuel efficiency figures are for comparison purposes only. Your actual mileage may vary, depending on speed, weather and trip length. Your actual highway mileage will most likely be lower.)

In fact, despite all the flurry of emulation, the 320i—with its fully independent suspension, precise steering, and decades of technological refinements bred on racecourses—remains unique.

So much so as to awaken an almost unseemly ardor in automotive critics who are implacable for a living.

One nominates the 320i as "the sort of car enthusiasts turn into legend." He might have added that there are no reasonable facsimiles for legends.

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According to the January 1981 NADA Used-Car Guide, while the value of other cars was dwindling considerably, the average 320i sold over the past 4 years retained a phenomenal 95.2% of its original price.

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If you suspect you might not be content to spend the next several years with a surrogate, we suggest you contact your nearest BMW dealer for a test drive.

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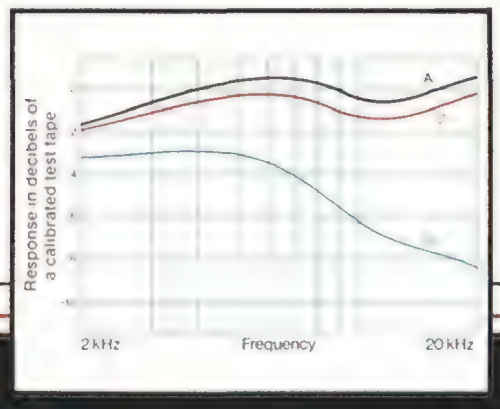

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Return to sail

Dear Sir: As an aficionado of both your magazine and of the art/science of sailing, I especially enjoyed this article. However, your description of the Flettner Rotor Ship is erroneous. The "smokestack" did not contain large rotors. Instead, those 15-meter-long spools *were* the rotors which, on large bearings, revolved around long internal truss masts. The rotors were not wind driven, nor were they driving propellers; they were driven by small electric motors. They operated on the principle whereby a moving body of air, on striking a rounded rotating surface, is deflected parallel to and in the direction of rotation. A high-pressure area is created on one side of the cylinder and a low-pressure zone on the opposite side, resulting in the ship's being driven forward toward the area of low pressure.

However, headwinds necessitated tacking, as with sail, and a tail wind pushed the craft sidewise. Its main drawback lay in its inability to "reduce sail" in the absolute sense. Additionally, the relatively thin metal cylinders appear to have been vulnerable to wave damage in a storm.
Jean Saint-Thomas
Vero Beach, Florida

Origins

Dear Sir: There are in America today many people—yes, even Smithsonian Associates—who still follow the ways of the Old Religion. Is it not possible that primitive Man commemorated the decline and return of the sun, as we do today—in celebration rather than in fear? The winter solstice ritual is a tribute, a reenactment of an important natural phenomenon, and is no more "homeopathic magic" than is a Christian nativity play.

Michael Olmert says ". . . let us hope that someone somewhere, will be stoking the fires on this year's solstice." Don't worry, sir, we have taken care of it.
Frankie Stoffer
Iowa City, Iowa

Dear Sir: Your article seemed to ridicule one of the more tragic moments in theater history, the *danse des sauvages* held at the court of Charles VI. Charles' presence

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among the dancers was kept secret from all but the Queen and while he was conversing with the 15-year-old Duchesse de Berry, two revelers entered carrying torches. Sparks fell, and the dancers were afire. The Queen swooned, but the Duchesse, who had by now recognized the King, saved him by throwing her skirt over him and smothering the flames. Sire de Nantouillet doused his flames in a barrel of water used for cooling the wine; four others perished.

The deadly consequences of this frolic have been thought to have intensified the King's insanity and certainly increased public dissatisfaction with the court.

Merle Fifield
Muncie, Indiana

John Bull

Dear Sir: Well, you guys have finally let the cat out of the bag. My suspicions were aroused in the summer of 1976, when I stood for hours in the Arts and Industries Building watching steam engines turning amid periodic outbursts from some sort of musical contraption on the balcony. My wife was sure I had slipped a cog, but I was watching you—or at least some of you —and those marvelous things.

This issue, with dinosaurs, John Bull, and more, confirmed it. What a way to make a living—playing with clay, painting dinosaurs, running around in old trains and in general doodling about with the whizbangs of a culture. Sincere thanks to you all for maintaining and creating what, on occasion, can be hauled out for all of us to see and experience.

John Summers
Mount Vernon, Washington

Medieval woman

Dear Sir: I was surprised to find that a typical medieval wife did not work the land, rather than exist as a professional woman. A child of 14 not being married appears out of place, probably owing to her mother's spending so much time picking the flowers. And why was a medieval woman left alone so much—unless she had been abandoned by a sailor? To live and eat so well, even in medieval times, one must have had a sizable income or a garden with a good fence. If times then were what they are now, a teacher's salary would barely pay the rent.

Dr. Haskell seems to have imagined the medieval world revolving around 20th-century viewpoints, instead of cooperation and devotion to the church, castle and family on which I believe people in the Middle Ages had to rely for their daily existence.

Patrick Michael Flynn
Williamsburg, Virginia

Dear Sir: I could smell the lavender from the fields of southern France!

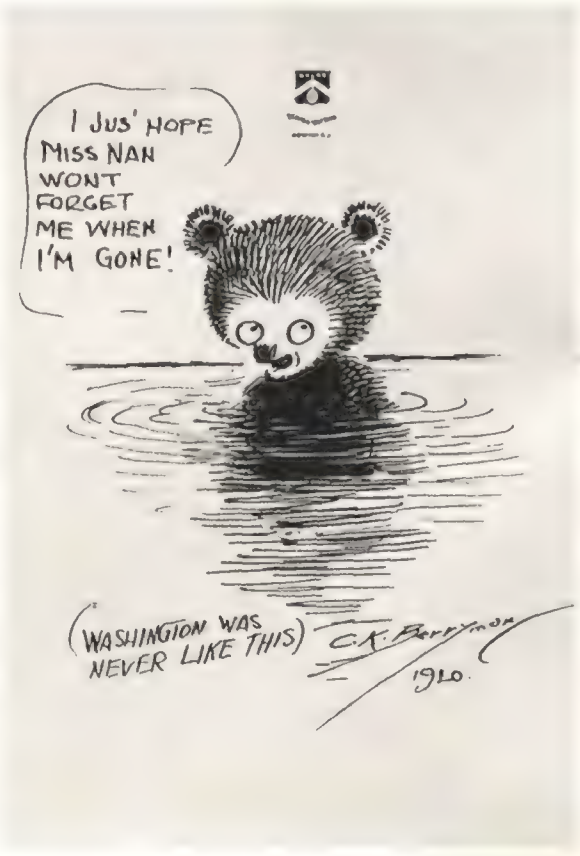
Mrs. Don D. Nigro
Denver

On the Mall

Dear Sir: Stuffed bears made in England and Germany were toys for children well before the famous Teddy Bear, inspired by Clifford K. Berryman's 1902 *Washington Star* cartoon of President Theodore Roosevelt sparing a bear cub's life, was created by Ideal Toy Company in 1902.

A friend, knowing I treasure Berryman's caricature of my grandfather, Washington lumber merchant Thomas Robinson Riley, and that I had attended the old Central High School in 1919-20 with the artist's son James (later, also a cartoonist), found this appealing little fellow [below] in a junk shop and bought it for me. It appears to have been sent to a friend by the vacationing Berryman.

Mary Alice Riley Heffner
Accomac, Virginia



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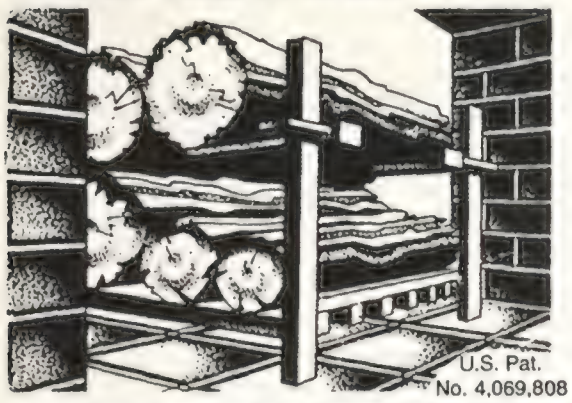

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For full scientific description, see L. Cranberg, Am. Jour. Physics, June '81. Reprints on request.

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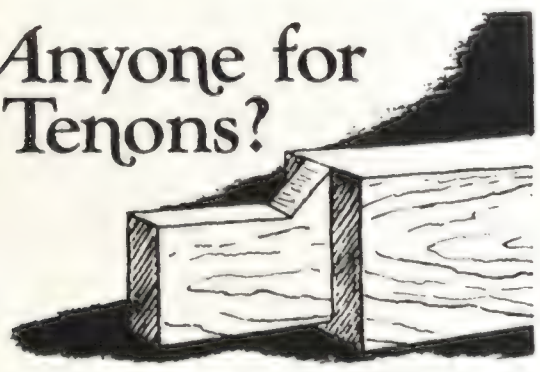

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Around the Mall and beyond

I was asked recently to describe the high points of the Smithsonian Institution. Being both obedient and literal minded, I went right to the task. Here is an accounting of high points that I have personally experienced:

1) The 8,500-foot summit of Mount Hopkins, Arizona, where the Smithsonian's and University of Arizona's Multiple Mirror Telescope resides. Expansive view; dry, clean air.

2) The 150-foot tubular steel tower that rises into the rain forest canopy on Barro Colorado Island, one of the Institution's primary stations for tropical research, located in Panama. Well stayed by steel cables, but nevertheless all atremble as you go higher; nice to be among the high foliage, but scary to look down.

3) The flag tower of the castle on the Mall. An unsuspected glimpse of history, 145 feet high.

It was the weathervane that led me up into the flag tower on a bright day in early winter. It swings in the wind above the flags, rotating atop the 45-foot flagpole, but once every 20 years or so it has to be brought down and repaired. The tail of the weathervane—the part that catches the wind—consists of two lengths of wood, flared outward to snag any wandering zephyr. Constantly exposed to the elements, the tail eventually splits and must be renewed.

When I noticed that the weathervane wasn't there, I checked with James M. Goode, curator of the castle and historian extraordinary of the Institution and, indeed, of all Washington. After all, for those of us who are accustomed to the Mall, losing that weathervane is rather like finding that Pike's Peak has vanished. Goode explained the problem. And when the device went back up, we decided to go have a look at it, close up.

We joined forces with Eric Gaardsmoe, the Smithsonian's own rigger—a remarkable man for a remarkable specialty. Eric routinely climbs to breathtaking heights to affix exhibits and to see that roofs are sound. Shinnying up that 45-foot flagpole, above the tower, was no big deal to him. To get the weathervane down and then up again, he had lashed up a gin pole—a simple derrick—so he could hoist the shaft out of the hollow pole.

We took a certain elevator in the castle and pressed the button for the eighth floor. When we reached it, Eric produced a key; a quick turn allowed him to press the 12th floor button—the "flag floor." As we rose again, the glass panels on the doors we passed gave views of one empty, forgotten little chamber after another. I *think* they were empty, but there may have been an occasional footprint on a dusty floor. In the castle, you never know.

When the elevator stopped, we emerged into a cold, dim, bare, brick-walled room with a high ceiling. Ropes dangled through an open tube from the roof. It opens into a funnel shape. The ropes are flag halyards, and the tube allows guards to fly the colors from below deck.

A vertical steel ladder leads up to a hatch in the ceiling. This can be opened by a chain that rotates around a drum. The same design was used to raise or lower a portcullis.

Rigger Eric Gaardsmoe raises weathervane.

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Sea Island

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The hatch was open, and we climbed the ladder and stepped out on the deck. First impression: a very big sky. The tower can't compete with the Washington Monument, of course, but it affords a sweeping view of the District of Columbia, with bits of Virginia and Maryland thrown in. On this bright day, thankfully without wind, we all stared out at the Potomac, the distant hills, in silent appreciation. From *that* direction had come the British soldiers in 1814 to burn the White House and Capitol; from over *there* had come the Confederates under Jubal Early 50 years later, pushing as far as Fort Stevens, at what is now Georgia Avenue, before retreating. From all directions now comes the endless army of tourists.

We stood on a small, level roof surrounded by a low, crenellated wall of the castle's red-brown sandstone. It's just the right height to lean on and look down at the ground. Gulp.

Far below is the south tower where the flag was apparently supposed to have flown, but never did. On its roof is a large wooden birdhouse for young falcons. A number of the birds have been raised and freed here (Around the Mall, September 1980), and the little structure with its miniature battlements is kept intact because falcons tend to return to the homes of infancy.

The U.S. flag was not flown over the castle until about 1880, and it wasn't hoisted on a regular basis until the 1930s. The blue Smithsonian flag with its gold sunburst began flying below the Stars and Stripes in 1965.

Above us, the restored weathervane swung idly in the calm air. It's nearly 12 feet in length, a simple arrowhead with a flared tail. Eric assured us it weighs 100 pounds. The flagpole used to be wood but was shattered by lightning in 1947. Now it's steel—with protection against lightning.

Extending from the ladder leading to the tower's deck are two metal pipes. They once protected cables attached to measuring instruments on the roof, remnants of a series of solar radiation experiments begun by Dr. Charles Abbott back in the 1920s. He was the Institution's fifth Secretary, who died in 1973 at the of 101. The only other notable item on the roof is a folding metal chair.

Another Smithsonian Secretary visited the castle towers, and at least on one occasion he was accompanied by the President

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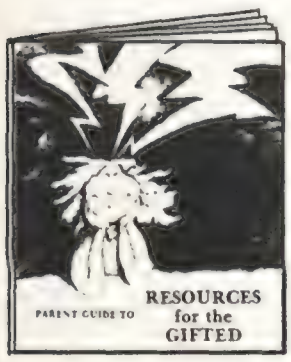

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of the United States. Joseph Henry, first Secretary of the Institution, apparently climbed a tower late one evening—and Abraham Lincoln went along.

A new book, *Mr. Lincoln's City*, written by Richard M. Lee and published by EPM Publications in Virginia, links today's capital with the little town of Civil War days, leading the reader along the streets of the modern city and simultaneously turning back the calendar to make him feel the Washington of the early 1860s—to smell the dust and sense the rawness and hear, sometimes, the far-off grumble of the great guns.

One unchanged site, of course, is the castle. "In early 1862," writes Lee, "an Army officer entered Mr. Lincoln's office with no less than Professor Henry himself as his prisoner. 'Mr. President,' he announced, 'I told you a month ago that Professor Henry is a rebel. Last night at midnight he flashed red lights from the top of his building, signaling to the Secesh. I saw him myself!'

"Lincoln looked at the physicist. 'Now you're caught! What have you to say, Professor Henry, why sentence of death should not be immediately pronounced upon you?' Then smiling, he patiently explained to the officer that the night before, he himself had been with Professor Henry in the Smithsonian Tower 'experimenting with Army signals.' "

On the 12th of this month, Lincoln would have been 173 years old. On the 22nd, George Washington's anniversary reaches the quarter millennium—and so he rates special attention from the Smithsonian. Washington's personality has been so obscured by his monuments that this remarkable man, this great setter of precedents, has become perhaps our least-known hero. But over at the Museum of American History steps have been taken to set that straight.

The important Washington exhibit there starts off with the symbolism of the man as described on page 74. But then it leads you past the facets of the heredity and environment that shaped this extraordinary character. You move from the museum's west corridor where the symbols of Washington amuse and sometimes shock (he appears in a picture on the platform at a 1939 pro-Nazi rally in Madison Square Garden) to other rooms, along vistas, past a mural, in front of displays.

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Then you are back with the symbols, understanding them afresh and aware that you also understand the man. The enigma of George Washington has largely been unraveled, the puzzle solved.

Margaret Klapthor, curator of political history, who, with technician Howard Morrison, accomplished this tour de force, points out that Virginian aristocrats of the 18th century were reared with the sense that they had a specific role to play in life. Washington certainly did, and used expressions relating to the theater in his most revealing writings—his diaries and personal letters. And so the Washington exhibit, which opens, of course, with a birthday ball, is titled "G. Washington: A Figure Upon the Stage," and the various galleries and areas have been named from his aptly theatrical quotations: "Taking care to perform the parts assigned" for those formative years; "The great theatre" for his war years; "The reluctant encore" for his return to public life as President.

Mrs. Klapthor has managed to gather here Washington items from all over the country. Probably, as she says, they are all together for the first time since the General's lifetime, thanks to the generosity and cooperation of Mount Vernon, the Library of Congress and major museums nationwide. Don't miss them.

Washington is also celebrated at the National Portrait Gallery with 40 to 50 prints and illustrations. Of course the man didn't directly pose for these, but he did sit for enough portrait painters to develop the habit, as I was reminded by a local Washington scholar, E. Harrison Clark. Mr. Clark has always been disconcerted by the idea that generations of us can only picture Washington with those cold eyes and that grim mouth and the words "One Dollar" underneath. Clark contends that the General was a charming and genial man.

"As his fame grew," writes Clark, "he posed for a variety of good and bad artists, a process he summed up to Francis Hopkinson in 1785: 'I am so hackneyed to the touches of the Painter's pencil, that I am now altogether at their beck, and sit like patience on a Monument, whilst they are delineating the lines of my face. It is a proof among others of what habit and custom can effect. At first I was as impatient at the request, and as restive under the operation, as a Colt is of the Saddle. The next time I submitted very reluctantly but with less flouncing. Now, no dray moves more readily to the Thill, than I do to the Painter's Chair.' "

Edwards Park

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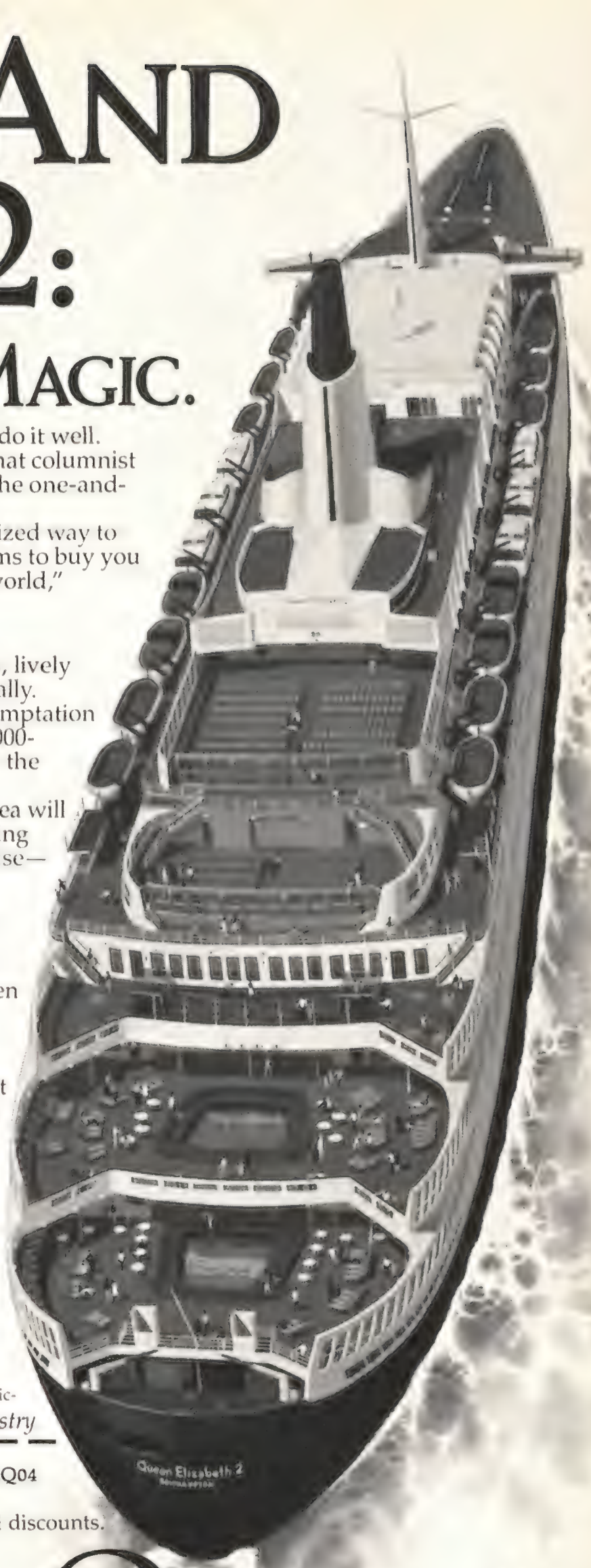

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Phenomena, comment and notes

Mary Midgley contends that it is OK to dislike dollar-snatching cormorants.

A British philosopher argues that we are too complicated for any single principle to explain the way we behave

Deep down, I don't think of people as just part of biology. Sociobiologists argue that we inherit our behavior (SMITHSONIAN, September 1980), but I don't think of us that way. Yet I certainly believe we are part of the "natural world," sharing the planet with sea gulls and slugs and sedges that have as much right to be here as we do. Sometimes I think we will learn to live with each other and with all the other living creatures, and sometimes I think we won't, especially after reading the newspapers. Are we really intelligent, or just a blind biological system hell-bent for destruction? It is all very fuzzy, seemingly insolvable and easy to put aside in the rush of day-to-day living.

So I sat right up when, looking through the essays for the Smithsonian symposium on human adaptation (SMITHSONIAN, January 1982), I read one by Mary Midgley devoted to nothing less than a new understanding of human nature. Her arguments—that we are more complicated than our own theories give us credit for—made so much sense that I felt better immediately.

Midgley is a tall, white-haired philosopher at the University of Newcastle upon Tyne. Her books include *Beast and Man: The Roots of Human Nature* (1978) and *Heart and Mind: The Varieties of Moral Experience* (1981). She was the last speaker on the afternoon of the last day of the symposium and spoke hurriedly, racing the five o'clock deadline in the artificial dusk of a small theater, but I hear her still.

She thinks things are not going well these days, and people are avoiding that reality either by pretending things are not really so bad, which she says will not get us far, or by concluding that there is nothing we can do. But what we can always do is change our way of thinking. If the way we look at the world encourages us to make a mess of it, that is where we have to start.

Every age has its bias, Midgley says, quoting the Devil in C. S. Lewis' *The Screwtape Letters*: "The game is to have them all running about with fire extinguishers when there is a flood, and all crowding to that side of the boat which is already gunwale under." The bias that distorts our thinking today, she suggests, is "an unbridled, exaggerated individualism . . . an unrealistic acceptance of competitiveness as central to human nature. People not only *are* selfish and greedy, they hold psychological and philosophical theories which tell them they *ought* to be selfish and greedy," she says. The theory of evolution gives no ground for this kind of fantasy at all, Midgley contends; such a view "finds no support in biology."

If we were only selfish egoists who engaged in social contracts in our own self-interest, then such deferral of satisfaction as we could muster would not be enough to produce a harmonious world. Without stronger social motives, our world col-

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lapses. "On every side now we can see people busily engaged in sawing off the branches on which they (along with many others) are sitting, intent only on getting those branches to market before the price of timber falls."

But there is a whole set of motives which in the past, at least to some extent, prevented this degree of destruction. These include "conventionality, identification with one's group, the fear of hubris, of novelty and excess, loyalty, respect for one's elders, and a general awe at the mysterious otherness of nature." It is time, Midgley suggests, to go through this "mixed bag of motives," sorting out what is useful and reexpressing that part in contemporary terms.

"Anthropologists," she argues, "showing us how the cumulative nature of culture demands continuity and how the murder of a culture can kill its members, have given us reason to have a far better opinion of conventionality, loyalty, identification with the group and respect for the elders than we used to."

Ecologists have pointed out there is good reason to fear hubris and hold nature in awe when we still have only a superficial understanding of the physical systems on which we depend. "Social psychologists have drawn attention to the complex dependence of human individuals on their background," Midgley says.

Tyrants remain, she concedes: "But what chiefly confronts us today is not an Easter Island row of ossified traditional patriarchs, but a chaotic mob of dollar-snatching cormorants, doing damage of an order undreamed of in previous ages."

Since the Renaissance, our culture has tried to pry the individual loose from his family, his state and his church, freeing him to think and act for himself. To the philosophers of the Enlightenment, it was taken for granted that humans are both social beings and part of the natural world. But after several centuries of concentrating on individual liberty, we find it difficult to articulate the oneness of the world. We find it equally difficult to express disapproval of those cormorants, because we no longer can say things like these people are betraying their ancestors, that they are "matricides destroying the land which gave them birth."

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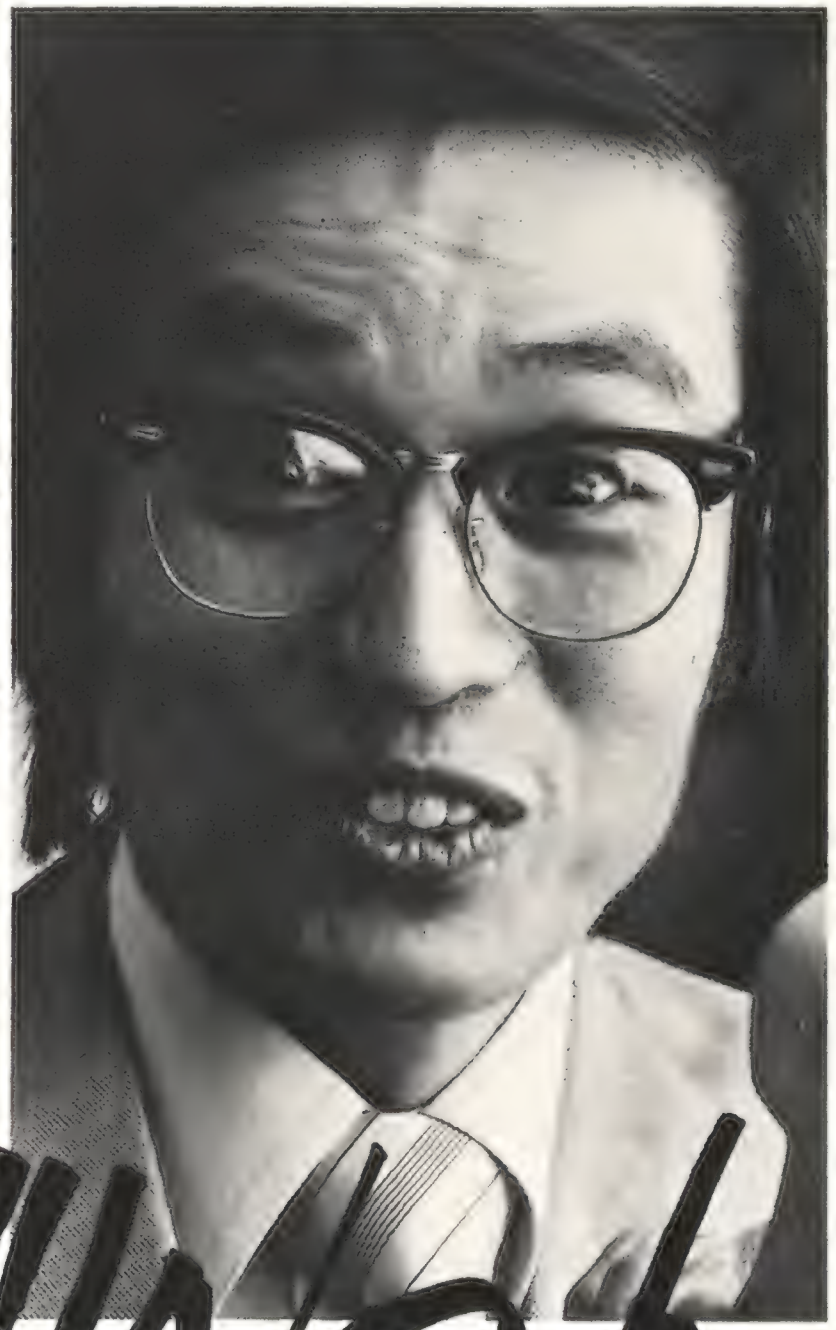

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way proper and admirable, because it is still a form of freedom. It appears as a monstrous parody of our most sacred ideals," Midgley laments.

We are stuck in this very uncomfortable place because Darwin's elucidation of evolution seemed to endorse egocentric competitiveness. Midgley disputes this interpretation, and suggests it has led to two areas of confusion. First, she feels many people are turning to Creationism because they see it as the only alternative to a view of human psychology based on evolution "which they rightly think both false and immoral." The other area of confusion concerns sociobiology, which she feels will eventually put social Darwinism to rest once and for all, but which cannot yet admit to itself that anybody does anything except for gain. (A commentator at the symposium thought she was letting sociobiology off too lightly, but this only strengthens her argument that there can be no single explanation for human behavior.)

She quotes Edward O. Wilson, in his 1975 book, *Sociobiology—The New Synthesis*, predicting ambivalence in social creatures: "what is good for the individual can be destructive for the family; what preserves the family can be harsh on both the individual and the tribe to which its family belongs; what promotes the tribe can weaken and destroy the individual, and so on. . . ."

Thus Midgley sees not the crude self-interest of social Darwinism but the opposite: complex individuals open to "varied and subtle social claims." The adaptation is always incomplete. "What natural selection produces is not a perfect machine for a single social function, but a workable compromise between many possible ones," she says.

She is all for individualism, but not to the exclusion of all else: "Human life, I flatly remark, does not have only one good thing in it. Besides individual liberty there are—to take a hasty random sample—such things as affection, generosity, laughter, celebration, home-coming, shared work and play, old people and children, cats and cucumber plants, frogs and fresh water. . . ."

It is just this effort to reduce all human concerns to some abstract unity that would strip us of attachment to particular people and things. We would be capable of living anywhere, including another planet, a prospect that leaves Midgley cold. "We may not make much sense here," she says, "but we would make none anywhere else. Reduction of our many motives to one simply does not fit the phenomena. . . . Neither egoism nor the pleasure principle nor any other single explanation can swallow the lot. Even selfish people commonly have particular affections, things out in the world which they mind about. Those who lose all interest in these tend to become incapable of living at all."

Until recently, she writes, we have classified environmental considerations as marginal, and so treated any emphasis on them as "sentimental, emotional, unrealistic and—above all—insufficiently virile."

If we were by nature indifferent to everything outside of human life, then perhaps we would have no responsibility to the biosphere that did not directly involve other humans. We could then regard it as a "scratching post," a device for giving us "satisfactory experiences." "But we do not so regard it," she says. "People's love for their native land (and for other lands), their admiration for other species, their response to seas and mountains simply does not take that form. It is direct. It does not see the non-human simply as a means to human ends, but values it precisely because it is not such a means."

Midgley's essay offers, in the best tradition of scientific papers, a test of her theories. She asks us to suppose we could be sure that our present tendencies to wreck the biosphere would not take effect until after the deaths of certain people we choose—our grandchildren, for example. Would we then happily accept these tendencies? She thinks most of us would feel no relief, but would still view these tendencies with guilt and horror:

"That guilt and horror are certainly not trivial, artificial products of our culture: first, because people in almost any culture would share them, and, second, because our own culture has for the last two centuries done everything it could to get rid of such feelings. They are real scruples, as genuine as any that we can feel, appropriate to the occasion and fundamental to human experience."

I'm sure that Midgley's essay will not be the last word on human nature or our relationship to the biosphere, but I found it enormously encouraging.

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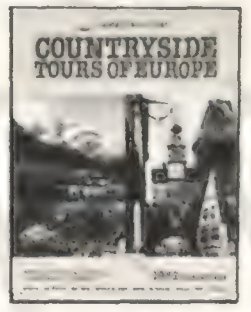

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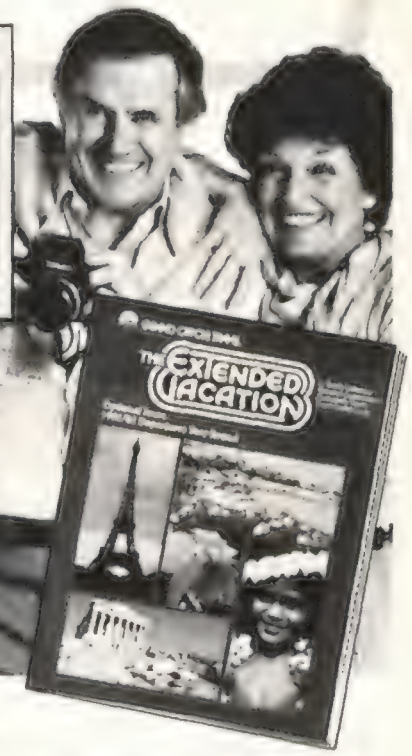

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The idea of handicapping has become a commonplace in modern life. We do it at the racetrack and on the golf course, and less rigidly in the classroom and around the family hearth, where younger siblings are traditionally given leeway in games and conversation. We willingly submit to all this in the spirit of fair play. Similarly, on the American frontier, the Colt .45 was considered the "great equalizer" for good guys and bad guys of wildly unequal physical stature.

But the systematic use of fair play and giving the "little guy" a break is not a modern idea. It has roots deep in the Middle Ages, at a time when a body of local laws and customs grew up to regulate the everyday exchange between man and neighbor, serf and lord. For example, when the English village workers on the Essex manor of Borley were required to help in hay harvest, each man was entitled to as much mown grass, for each day he labored in the field, as he could manage to lift with just the point of his scythe. A similar custom allowed each man delivering goods in his cart to keep as many oats as he could "thrice take with his hand."

The tenants of the Frauenkloster Abbey, near Zurich, were allowed to settle disputes over the extent of their poultry runs with a throw of a sickle. (Neighbors, it seems, have always been a problem.) The statute said that fowl could roam as far as the homeowner could throw, but with a special provision. Each man had to stand on the roof ridge of his home and throw with his left arm. The law was silent on the question of natural lefties. Doubtless, few self-respecting villagers would own to being "sinister" southpaws. Elsewhere, tenants were permitted to let their chickens wander as far as the hausfrau could throw an egg from the roof ridge. She could use her veil as a sling to give the heave added distance.

What we see here are laws and customs that give legal status to athletic prowess. Take the matter of removing wood, even dead branches, from royal or ecclesiastically protected forests. Ordinarily, this was strictly forbidden. But there was an exception. Local villagers were allowed to keep the wood they had illegally taken so long as they had carted the contraband more than an ax throw from where they cut it before the forester arrived. Again, the law seemed to handicap in favor of the oppressed. The forester was obliged to throw left-handed. But the matter did not end there, according to rules set down by the bishop of Strassburg in the 14th century: "then may the forester, if he will, follow after the cart, and thrust his right hand under his girdle, and with his left hand drag from the cart what wood he may, until he come to the man's own toft. So far may he go; but, if he follow the man into his toft, and the peasant then turn round and smite the forester on the head, even unto death, then shall no judgement be passed upon him. . . ."

The late G. G. Coulton was the first historian to comment extensively on this inclination of the Middle Ages toward "the sporting chance" in daily life. In fact, he used the phrase as a chapter title in his richly detailed book *The Medieval Village* (Cambridge University Press, 1926).

In practice, such local customs acted to take the hard edge off some extremely punitive and arbitrary rules. A criminal could have six weeks and three days of freedom if, on his way to prison, he could spot a monk outside the cloister and catch him by the cowl. A common prison term

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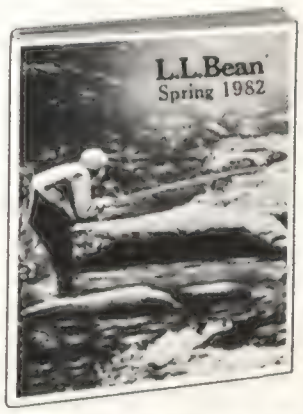

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was the length of time that a man would take to consume two bushels of wheat—a rule that likely transformed many a light eater into a trencherman.

Even the athletic ability of a peasant's livestock could be called into question. One measure of length was "as far as a tame hen can go at a single flight, which is reckoned at 300 of a man's paces." As for the tithe fowl that tenants were required to render to their landlords yearly, both goslings and sick hens are mentioned specifically in the manorial customs. A gosling could be rejected if it was not old enough or strong enough to pluck grass by itself without sitting down. But even a sickly hen had to be accepted by the lord if, when the animal was startled, it could jump the garden fence.

Boundary rights were settled according to an ax or hammer throw from recognizable landmarks. Legal rights might extend out into a lake "as far as a man can ride in his saddle from the shore." Or riparian rights might extend a barge-pole length up the beach.

The peasant who wished to move to another manor or another village was ordinarily not allowed to do so. Medieval farming was labor-intensive, as they say these days, and the alert steward or reeve would do his utmost to keep his field hands at home. The result was a contest that pitted a tenant's fully laden cart and his oxen against the steward in a tug-of-war. If the oxen won, the man and his family moved on; if the steward, using one hand, could win, the family stayed.

The whole concept of poaching is intimately connected with gamesmanship and the sporting chance. Since virtually all animals (except vermin) were protected by statute to provide meat and sport for the upper classes, any hunting or trapping at all was considered poaching. Game management was not developed at the time, so the ruinous situation forced many a poor serf to watch helplessly as the cosseted deer and hordes of rabbits chewed up his tender sprouts.

Eventually, the game laws became a test of wills between tenant and lord, with wild variations in enforcement. Even the statute books seem to connive at this game. Some regulations allowed peasants to keep hunting dogs if the animals' foreclaws were cut, to render them less effective—but certainly not useless—as hunters. In support of this limited access to the bounty of God's forests, a 13th-century German authority demanded "that no man might be maimed or slain for poaching." Where permitted, such punishments added spice to "the sporting chance." Indeed, they may have caused rabbit hunting to become the life-threatening equivalent of the modern big-game hunt.

For those cases that involved disputes between lord and servant, the corpus of "sporting chance" laws had special provisions. For example, the abbot of Glastonbury in England gave his serfs one sheaf of wheat from each cartload they cut. But the rules for settling arguments about the size of the sheaf were much more extensive and complicated than the original, rather simple, allowance. Thus, "If any sheaf appear less than is right, it ought to be put in the mud, and the hayward should grasp his own hair above his ear, and the sheaf should be drawn midway through his arm [*i.e.*, inside the bend of the elbow]; and if this can be done without the defiling of his garments or his hair, then it is adjudged to be less than is right; but otherwise sufficient. . . ."

This is indeed a game, one apparently weighted in favor of the abbot. Only a perfectly clean hayward would qualify the hungry peasant for more grain. Obviously, it would take an extremely steady hand to get even the smallest of bundles through the arm crook without dirtying the hayward. But if the typical peasant realized his disadvantage, there is no record that he recoiled under the benign yoke of this and countless other sporting chances. At least the system held out the promise of more than he felt entitled to, even if the peasant usually lost.

With such exchanges a regular part of daily living, it is easy to see how the idea of life as a game became so conventional a part of language and literature. Life resembles a game because its outcome is always uncertain. A marginal painting in the pages of the famous prayer book of 1409, *Les Grandes Heures du Duc de Berry*, well illustrates this point. Here, a juggler balances a plate on a long pole above his chin; his other hand manipulates a rod to spin the dish. While he concentrates on the magic taking place in the air over his head, a dragon slithers into the picture from below—about to devour the acrobat's foot (p. 32). Life is like that, chances are.

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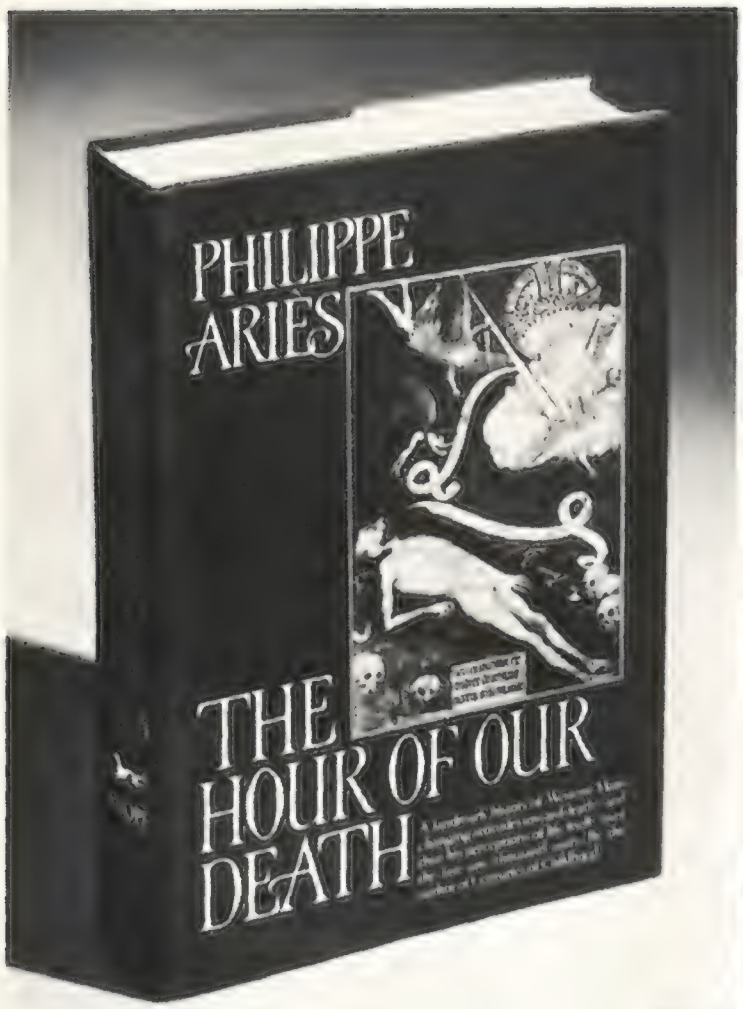

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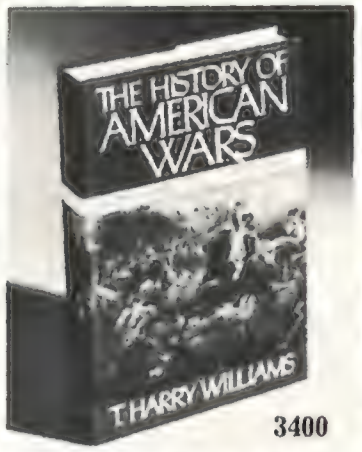

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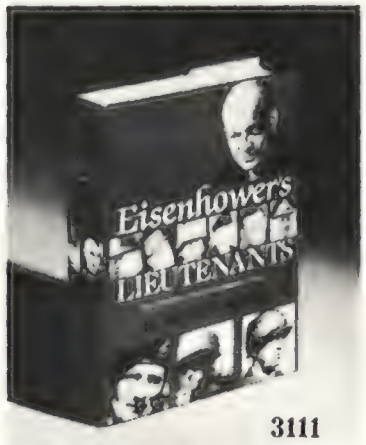

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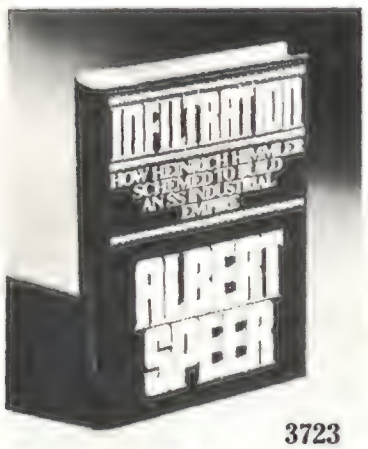

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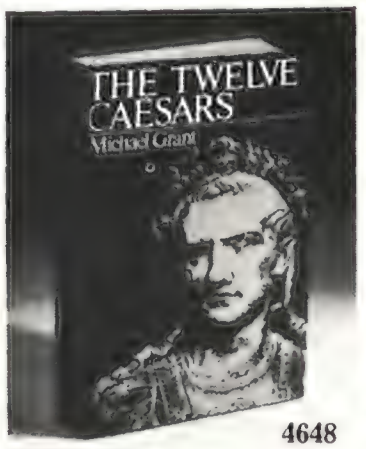

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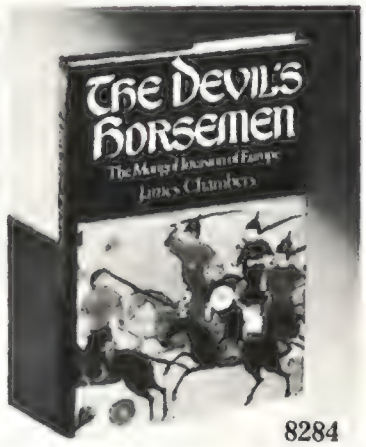

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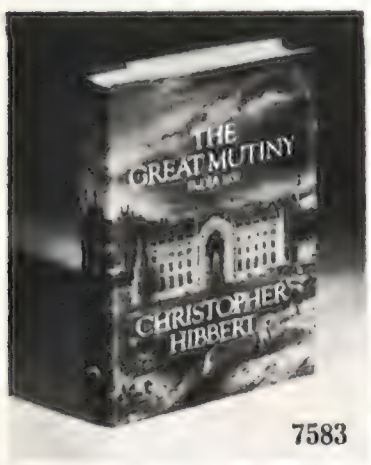

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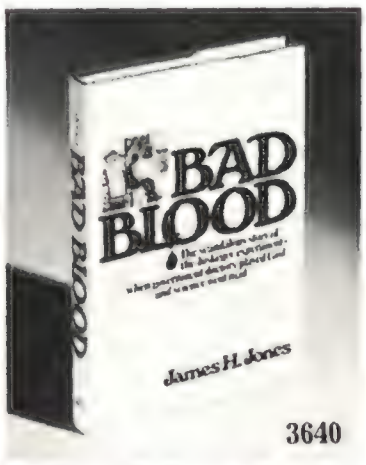

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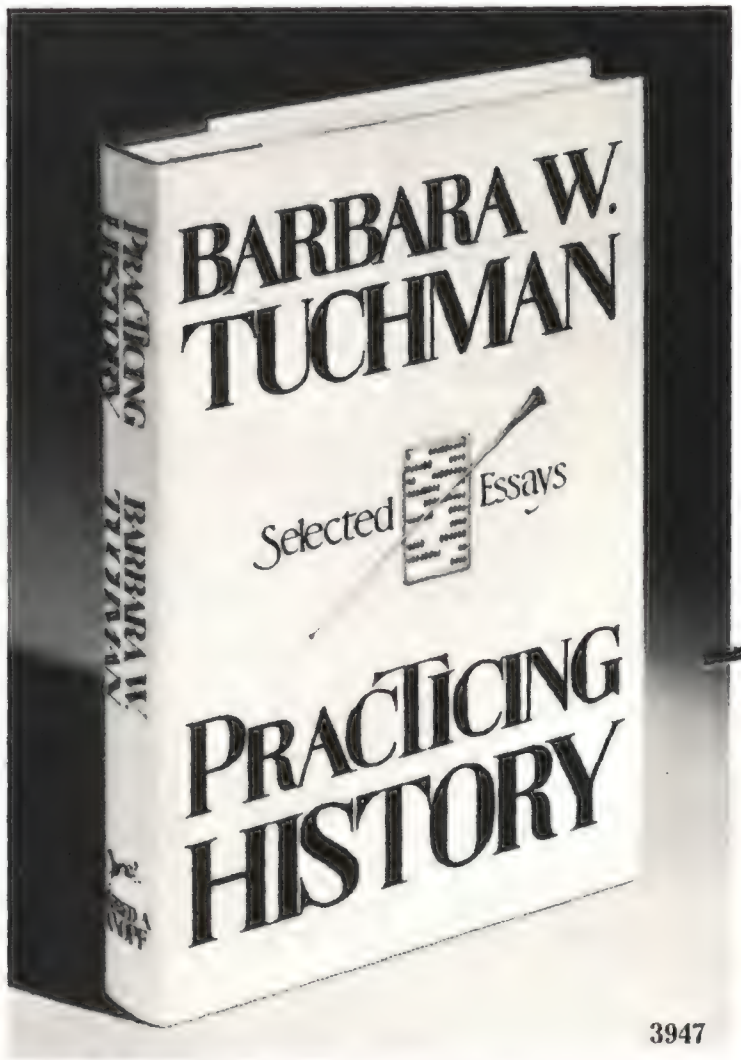

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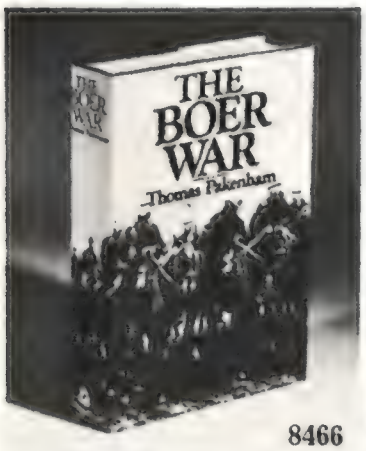

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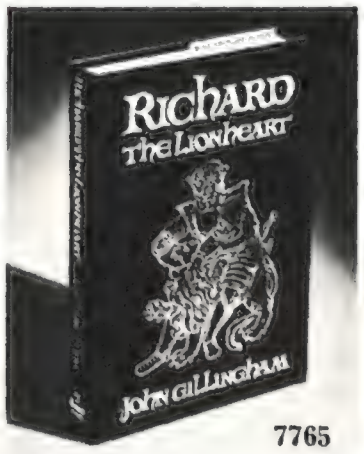

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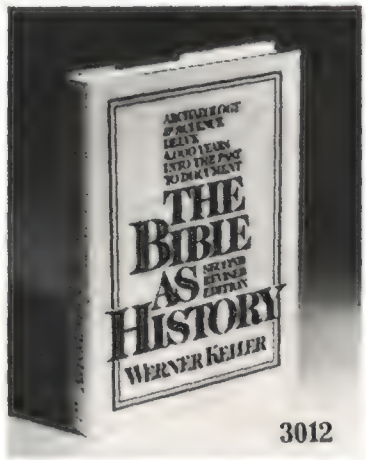

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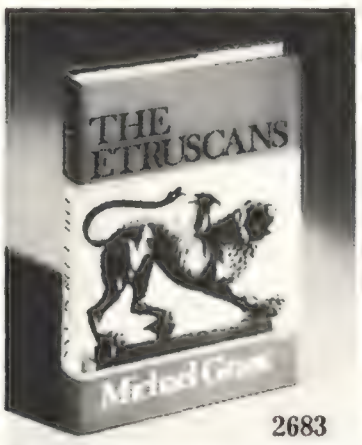

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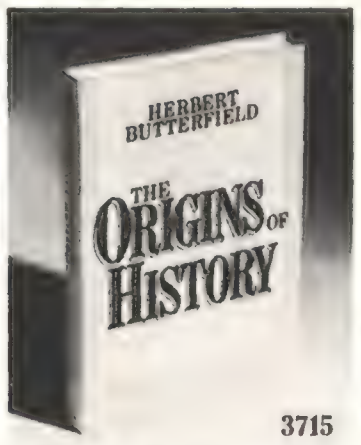

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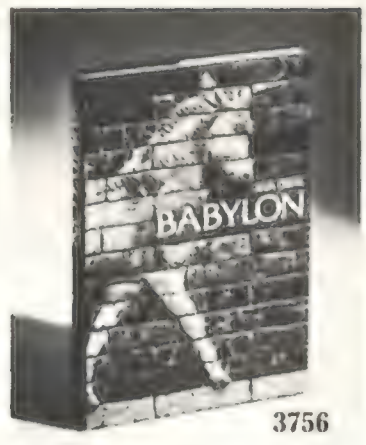

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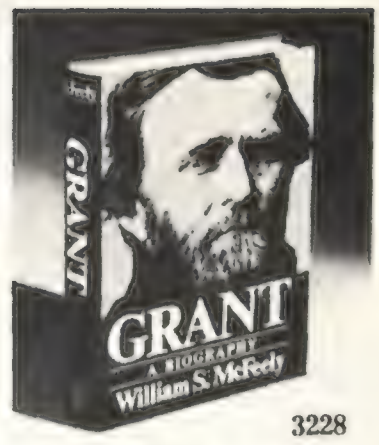

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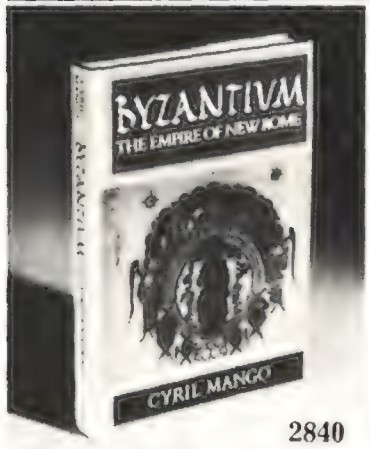

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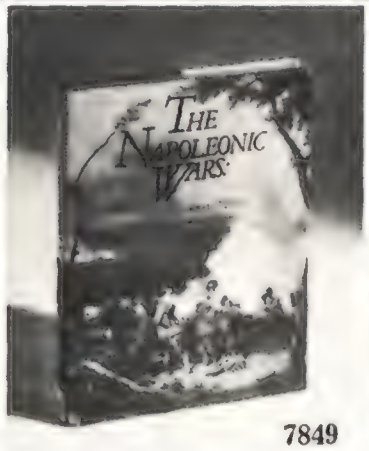

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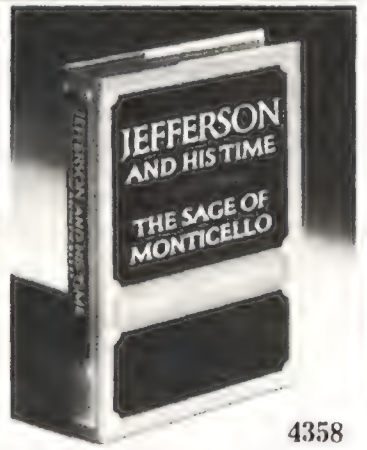

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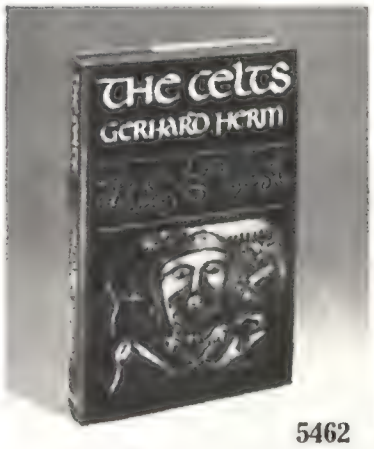

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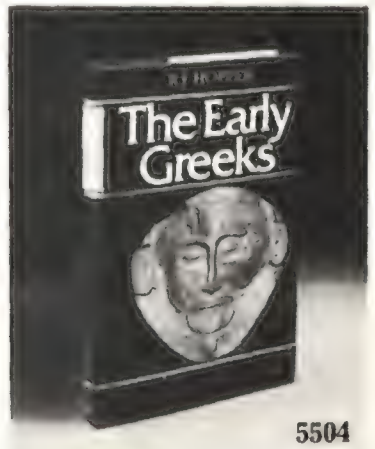

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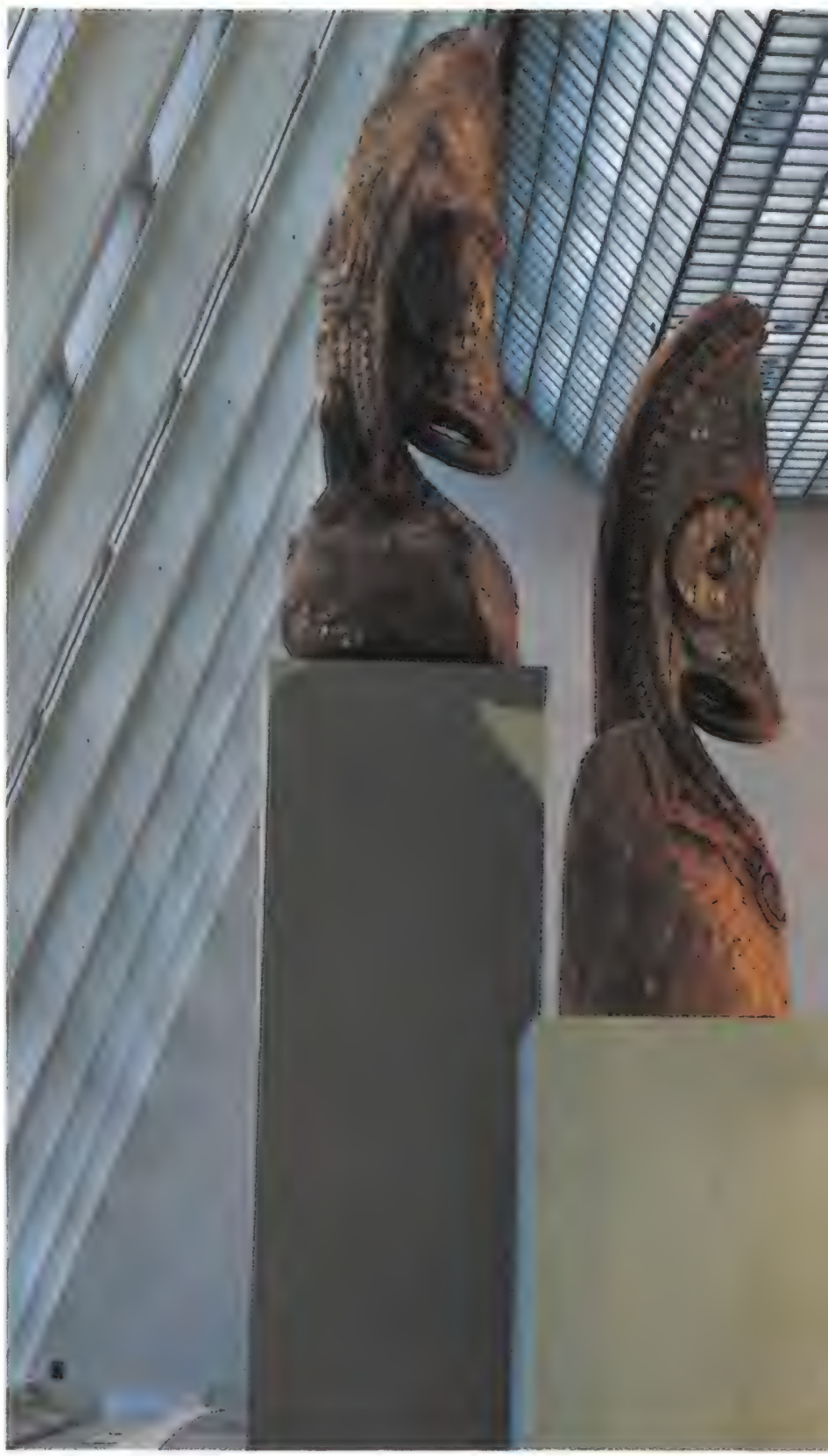
By Charlotte Moser

A grand new showcase in New York pays a tribute to primitive art

More than 350 years before the French Post-Impressionist artist Paul Gauguin discovered the magic of the art of the South Seas, and almost 400 years before African sculpture revolutionized the work of Pablo Picasso, another European artist—Albrecht Dürer—fell in awe of ancient Mexican art. Spellbound by the "wondrous artful things" brought back by Spanish plunderers from the Aztec empire of Mexico, the 16th-century German artist, writing in his diary in 1520, "marveled at the subtle genius of men in foreign lands." Artists and imaginative collectors have long responded to the purity of design and workmanship of the art of primitive cultures, which André Malraux called "the functional arts of the soul." But, despite centuries of exploration in far corners of the globe, right up until only about 60 years ago objects of such esthetic power were largely sent as ethnographic specimens to museums studying the history of Man, not the history of art.

Art history is a story of changing tastes, but at New York's Metropolitan Museum of Art the doors to a place in art history do not open easily. Art historical authority hangs heavy in the marble halls of the Met. It pervades the galleries of Renaissance art, floods the corridors of Greek and Roman sculpture and settles with a reverent calm before the mysteries of ancient Egyptian art. Centuries of accomplishment by mankind's creative spirit are laid out, riveted in time, for millions of spectators to admire and ponder. This month, with the opening of the Michael C. Rockefeller Wing at the Metropolitan, the primitive arts join the ages of art history with the world's largest tribute by an art museum to the arts of Africa, the South Pacific and the pre-Columbian and Native American arts of the Americas.

The core of the Michael C. Rockefeller Wing is the 3,500-piece collection of the Museum of Primitive Art, which operated from 1957 to 1975 on West 54th Street directly across the street from the sculpture garden of the Museum of Modern Art. The late Nelson Rockefeller founded the museum to house the growing body



In Pacific gallery fanciful heads from Vanuato face towering ancestor poles from New Guinea.

Photographs by Lee Boltin

The new Michael C. Rockefeller Wing at the Metropolitan Museum celebrates societal arts of Africa, Oceania and the Americas

A Dogon sculpture is of the type that has long fascinated anthropologists and entranced art lovers.

A grand showcase for primitive art

Bought for record $575,000 in 1979, this "Buli Master" from Zaïre is one of a handful in this country.

of primitive arts he had been collecting since the 1930s. Rockefeller, also a trustee of the Metropolitan, had long tried in vain to interest the Met in developing its pre-Columbian art collection. Prior to the 1960s, the Met's holdings consisted primarily of a group of ancient Peruvian ceramics and textiles, some ancient Mexican sculpture, and no more than one piece of African sculpture.

The Metropolitan's staunchly conservative position did not change until 1969, when, before its opening of the show "The Art of Oceania, Africa and the Americas," on loan from the Museum of Primitive Art, Rockefeller offered the collection to the Met. When the Metropolitan accepted the gift, a page in art history was turned. Not only did the gift bring 3,500 pieces of art, its library and photographic archives to the Metropolitan, but the Museum of Primitive Art's curatorial staff as well, including director Robert Goldwater and curator Douglas Newton. In 1969, as a result of the gift, the Met started its first primitive art department with Dudley T. Easby jr., then museum secretary and a pre-Columbian specialist, as the first chairman. Goldwater succeeded Easby in 1973, followed, in 1976, by Newton who is now chairman. Newton also acts as curator of the Oceanic collection of the Department of Primitive Art, with curator Julie Jones working in the pre-Columbian area and associate curator Susan Vogel in African art.

An $18.2-million addition

A permanent gallery for the collection, named for Nelson's son Michael, who had drowned in 1961 at the age of 23 while collecting artifacts among the Asmat Papuans of Irian-Jaya, was a condition of the gift. The Met was then in the midst of its massive expansion program, which has led to the Lehman wing, the new American wing and the Temple of Dendur. The Rockefeller wing was added to the building plan by architects Kevin Roche and John Dinkeloo at the southern end of the Metropolitan, extending toward Central Park away from Fifth Avenue. The design included a 42,000-square-foot exhibition space, storage areas and curatorial offices.

More than a decade later, after a number of construction delays, the $18.2-million wing provides a stunning showcase for the collection with space divided equally among the three cultures. Individual galleries, planned by consultant designer Stuart Silver and associate Clifford La Fontaine, display important pieces. Under the soaring 50-foot-high glass ceiling of one gallery stand the huge Asmat *mbis*, or ancestor poles. An intimate, shadowy room houses the Treasury of pre-Columbian gold and jade objects, Peruvian ceramics, metals and textiles. Six tall, dramatic Afri-

Ivory head of kind worn on ruler's belt is from court of Benin, Nigeria, and dates from 16th century.

This Fang reliquary head of wood and metal was once owned by renowned sculptor Sir Jacob Epstein.

can Bamana sculptures are installed in open areas on low platforms.

Explanatory labels describing the cultures and objects guide visitors through the galleries. According to Newton, objects in the permanent exhibition galleries will be rotated regularly.

Since 1970, the Met's collection of primitive art has grown to more than 7,000 objects. After Rockefeller added his private collection in 1978, other important gifts followed. Among them are a group of 80 Dogon sculptures from Africa's Western Sudan from the Lester Wunderman Collection; a group of pre-Columbian objects—most of them gold—given by Alice K. Bache; and ancient Peruvian ceramics from the Nathan Cummings collection.

The new wing does not rival the world's great anthropological museums in scale. From its collection, only 1,500 objects, selected for their esthetic quality, will be shown—a small number compared to the vast collections of the American Museum of Natural History in New York, London's British Museum, Paris' Musée de l'Homme, and Mexico City's Museo Nacional de Antropología. Gaps exist in parts of the Met collection, most notably in the area of Native American art. But the collection is plentifully studded with marvelous works representing the artistic excellence of all the cultures.

The arts of these people are inextricably intertwined with their cultures. These are societies that rely on complex polytheistic religions to protect their often vulnerable existences. The artists in these societies use the visual arts as ways to communicate with the supernatural, ancestral dead and natural forces that govern their lives. All primitive art is representa-

Charlotte Moser, a free-lance writer in Washington, is a correspondent for Art News. *From 1974 to 1979 she was art critic for the* Houston Chronicle.

Found near Mexico-Guatemala border, wooden Mayan figure dates from the 6th century A.D.

Treasury of the Americas gallery displays Colombian, Peruvian, Costa Rican and Panamanian gold, jade.

tional of nature but the artists have selected aspects of realism that communicate most effectively with the spirits around them. Often sensuous animal shapes figure prominently as symbols of the natural vitality of the group. Materials used and the amount of decorative design sometimes denote the particular social status of the owner.

In light of the complex esthetic system of primitive art, the word "primitive" in its general usage is a misnomer. Indeed, the name "indigenous arts" was first considered as the name for the Museum of Primitive Art. Originally, the word "primitive" was meant to define cultures at an early technological level but, clearly, this cannot apply to such complex civilizations as the Mayan.

"The presence of the Michael C. Rockefeller wing at the Metropolitan will produce a new perspective on what world art history is like," says Newton, who believes the term "primitive" art may one day refer to an esthetic viewpoint in the way the term "Gothic," which originally meant "barbaric," now does. "This

Artfully crafted of gold mounted on silver, this crayfish nosepiece is from Mochica, Peru.

Silver beaker, about 500 years old, comes from Peru and is thought to have been for drinking beer.

is not a minor development in the background of art history. The way the museum is now treating these works puts them in the foreground."

The greatest storehouse of primitive art is found today in Africa in the countries south of the Sahara along the Atlantic coast and the mighty rivers, the Niger and the Congo. In this broad swath of rain forest and grassland, rich in minerals and hard woods, live culturally diverse groups whose world views differ from one another as radically as their art. Naturalism and elegant formal composure characterize the art of people from the Guinea Coast, where the great Ashanti, Abomey and Yoruba kingdoms once flourished. Abstraction and often wildly imaginative images mark more clearly the work of the artists of Equatorial and Central Africa. Rituals can vary from village to village and artistic vision, as well, from society to society.

In the savanna of Mali in the Western Sudan, two art-making groups of great stature—the Dogon and the Bamana—live just miles from each other down the

A grand showcase for primitive art

Niger River and yet their art is distinctively different. For more than 70 years, Dogon culture, its myths and symbols, has fascinated anthropologists. In the Rockefeller wing, tall, elongated, wooden figures, often with the merest suggestion of a face, are grouped or, like the monumental six-foot-tall Dogon figure with upraised arms (p. 39), stand alone in a pose of universal wisdom.

The Metropolitan owns a particularly complete collection of Dogon art. The 1979 gift of 80 Dogon sculptures by New York advertising executive Lester Wunderman augmented an already famous collection assembled by the Museum of Primitive Art. The art of the Bamana, an agricultural people, is highly decorative and stylized: among the best-known works are sculptures of antelopes in wood. Used as headdresses in a ritual dance, these spirited sculptures are as aggressive as the Dogon sculpture is reflective. Another neighboring people of Western Sudan, the Senufo, combine Dogon monumentality with avian symbolism. Huge geometric sculptures of hornbill birds with long curved bills, of which the Metropolitan has four, represent fertility and are used in initiating young men into the male societies that govern groups throughout Africa.

Since the 16th century, Europeans have brought home the splendidly worked ivories from the Guinea Coast. Early on, it was clear that no backward artisan could make these intricately carved sculptures. These sculptures, often depicting important personages in full regalia, resemble court art from Africa as well as from Renaissance Europe. Other naturalistic works are the small, shiny black, detailed sculptures from such countries as Ghana, Ivory Coast, Liberia and Sierra Leone, which have been highly favored by Western collectors of the 20th century.

Most African artisans were artists by trade but rarely is an individual artist's name known to us. The "Buli Master," a member of the Luba people of Zaïre in Central Africa, was one of the first whose distinctive, somewhat naturalistic style has been identified in some 20 pieces.

For naturalism, however, no African art can match the works from the court of the Benin in Nigeria. As early as the ninth through tenth century, lost-wax casting was used in the Igbo-Ukwu culture of Nigeria to fabricate bronzes. Principally a form of court art, the bronze castings led to a strikingly natural style of human portraiture with subjects dressed in ceremonial jewelry and head garb. Benin artists, however, were limited to neither bronze nor portraiture. A delicately carved 16th-century ivory pendant portrait once worn on a ruler's belt as part of his regalia is one of the finest African pieces in the Metropolitan's collection.

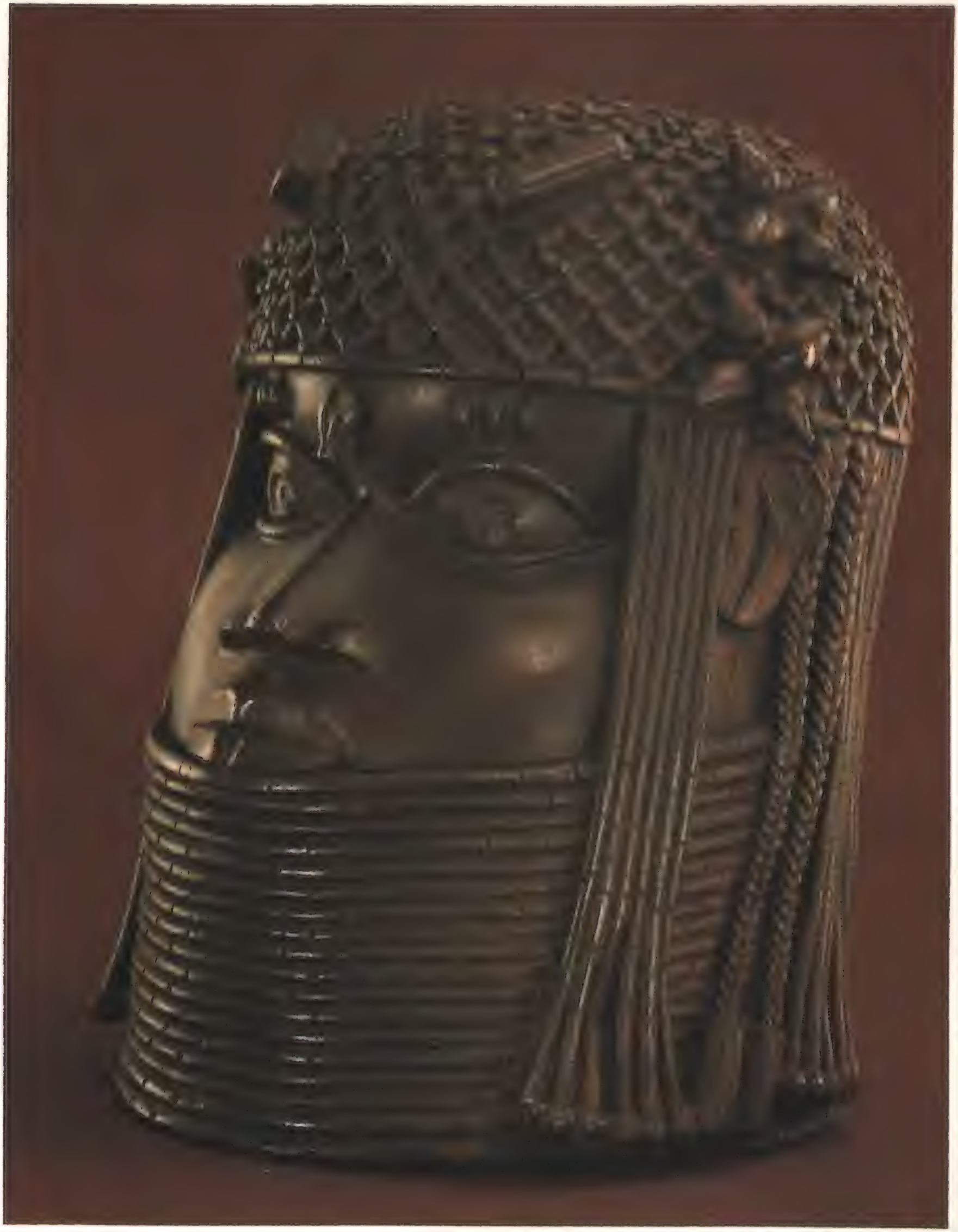
Cameroon is a crossroads in Equatorial Africa. Bounded on the north by the grasslands of Nigeria, it marks the beginning of the rain forests in the south and in the interior. With more than 100 ethnic groups, it is an artistic crossroads. Unlike the elegant composure of Dogon or Benin art, Cameroon masks are dynamic and full of expressiveness. The Metropolitan's sculptures from Cameroon are from among 60 acquired in 1972 from the Baptist missionary Paul Gebauer, who worked in Cameroon for 30 years, during which he came to admire the art of the region.

A face to frighten intruders

Even more remote from the composed naturalistic figures of West Africa are masks made within Equatorial Africa in the country of Gabon. A mask from the Fang people of Gabon is one of the abstract images that so profoundly first affected 20th-century European artists. One famous piece, a sculpture used to stand guard before a Fang reliquary, was once owned by the sculptor Sir Jacob Epstein (p. 41). With its metal disk eyes, the severely simple, intense and threatening black face was meant to frighten away the uninitiated and other intruders.

Nearly 7,000 miles east of the African continent, across the Indian Ocean and into the South Pacific, lies New Guinea, after Australia the largest island in the vast area called Oceania. Scattered to the east into the far stretches of the Pacific are thousands of large and small islands where people have lived for thousands of years.

Oceania also includes three island groups that make up a combined total land area of almost 500,000 square miles, an area approximately equal to the combined states of Texas, New Mexico and Arizona. Melanesia consists of New Guinea, the Admiralty Islands, New Britain, New Ireland, the Solomon Islands, Vanuatu, New Caledonia and the Loyalty Islands.



Compelling and masterfully wrought bronze head,
from 17th century, was made at court of Benin.

This superb sculptural representation, probably of the god Rongo, is from Gambier Islands in Polynesia.

Cat-faced, bulbous figure was made by Chancay people of Peru between the 13th and 15th centuries.

Micronesia to the north includes the Caroline Islands and the Marshall Islands. Polynesia, the largest area of them all, includes Hawaii, New Zealand, Samoa, Fiji, Tonga, Cook, Society, Tubuaï, Marquesas, Gambier and Easter Island.

Unlike Africa, which has been studied by historians for centuries, Oceania is relatively fresh ground for the scholar. The cultures spread across its vast expanse have few kingdoms (Hawaii was an exception) upon which its history could be traced. Usually confined to coastal sands or mud and forests of palm and bamboo for materials, artisans make works which have short lives in the humid climate. What stonework that exists is very rare and there is no metal work; iron was not prevalent until 19th-century colonization.

Yet the people of Oceania have produced an incredible outpouring of visual images. They decorate almost everything—household objects, musical instruments, canoes and houses. They make masks from wood, feathers, fiber and shells, and they paint on hammered bark. They even cover their bodies with the same tattooed designs, as though to engulf themselves in their art.

Because people who live along the ocean or rivers are more likely to have contact with other seafaring people, the art in these areas has remained more vital and diverse. Striking evidence is found in the 200 paintings from different clans that cover the ceiling of a ceremonial long house re-created in the Rockefeller wing. Commissioned by Newton in 1970 from the Kwoma people of the upper Sepik River, the paintings on palm bark show a wealth of imagination in

their depiction of such subjects as birds, fish, snakes, the sun and the moon.

Intricate openwork carvings with anthropomorphic patterns decorate the prows of canoes made from solid logs, drums, spears and massive interior posts. One large post in the Rockefeller wing covered with such designs was dragged from Lake Sentani in Irian-Jaya in 1964. The last of its kind ever found, it was used as an interior support for a chief's house built 60 years ago.

Lyrical carving also decorates symbolic sculpture. One remarkable custom of the Asmats is carving *mbis* poles, tall totems in which full male figures are stacked head to toe. These poles, which are often installed at 45-degree angles outside ceremonial houses, commemorate the victims of headhunting raids and serve as reminders that their deaths must be avenged. At the top of the poles, openwork carvings protrude as both phallic and fertility symbols. These provocative structures generally are left to disintegrate, but Michael Rockefeller sent home nine 20-foot *mbis* poles, which make a dramatic centerpiece in the Oceanic section of the Rockefeller wing.

As in Africa, masks are also used in harvest rituals. As a celebration for a good harvest of yams, one of New Guinea's staple crops, thin masks brightly colored in red, yellow, black and white conjure up promising spirits. Color itself is symbolic in New Guinea art, even when it is a bright synthetic blue paint acquired from Europeans.

Variations on the design themes of the New Guineans are used throughout the other Pacific islands. A temple drum from the Tubuaï Islands has a delicately patterned openwork wood stand. A ceremonial paddle from Easter Island is entirely devoid of the typical arabesques and, instead, is the simplest abstract design of two eyebrowlike arches. One of the rarest and most important objects is a wood figure of the god Rongo from the Gambier Islands; it has the stark simplicity of a no-nonsense icon.

Early art of the Americas

The art of the Americas presents an abrupt change in time, scale and materials. As though in a time machine moving into the past, a viewer leaves the more recent works of the South Pacific and travels to the New World where Indian cultures are still contemporary, then a century old, then 400, and then 3,000 years old.

When the Spaniards arrived in the Americas in the early 16th century, great Indian civilizations had flourished there for 3,000 years. The Metropolitan's collection of ancient art chronicles the glorious history of American art, where ceramic figures date to 2300 B.C. from the Valdivia region of Ecuador. An elegant red and orange painted vessel with a jaguar head was made by a Peruvian artist of the late Chavín period between 700-400 B.C. Clay pots of fine craftsmanship shaped into the characteristic stirrup spout configuration were fashioned by the Mochica of northern Peru as early as A.D. 100. At about the same time in the Nazca region, polychrome pots were being decorated with bold designs depicting mythological themes.

But it was gold, not ceramics, that the Spaniards wanted. In this civilization of artisans they found gold fashioned by skilled metalworkers into symbols of status. For centuries, the peoples of the Americas had mined the mountains for precious metals—gold, silver and copper. Using the lost-wax casting process, figures from gold were made throughout Colombia, Ecuador and even Panama and Costa Rica to the north. But it was the Peruvians, particularly the Chimu and Inca cultures from A.D. 800-1532, where the art of hammered gold excelled. A relatively soft metal, gold found in nuggets or mined from the Andes was pounded unheated into large sheets with stone hammers and anvils. Designs were formed by shaping the

This naturalistic mask is from the Torres Strait south of Papua New Guinea. Its use is unknown.

Dramatic sloping glass and metal wall of new wing, at south end of museum, overlooks Central Park.

gold foil over patterns, by rubbing it over raised textured patterns in the *repoussé* process, or by pressing it onto the surface with a tool.

In its South American collection the Rockefeller wing contains more than 200 beautifully wrought objects made from precious metals, primarily gold but also silver and jade. Two hammered gold masks from Peru were probably false heads for mummy bundles. Because gold was valued for its symbolic ties to the yellow sun and not entirely for its own glowing color, the masks were originally brightly painted in reds. In a civilization with a strict social hierarchy, gold possessions were also used to denote personal status. Delicate gold pieces and inlaid semiprecious stones decorated bangles, nosepieces and earplugs, ornaments worn by men in ancient South America. Gold ceremonial knives, gold beakers and pendants reflected the wealth and splendor of Peru before Spanish furnaces melted the beautiful gold objects into bullion.

Peruvian textiles rival the craftsmanship of pre-Columbian ceramics and metalwork. Though a large number of ancient Peruvian textiles were among the first pre-Columbian acquisitions of the Metropolitan, only two ponchos from the Wari-Tiahuanaco period are on view because of the high perishability of fabric when exposed to light. However, the bold designs and sensitive coloration of the ponchos illustrate a refined appreciation for simple geometric shapes which today seems contemporary. Even more geometric are nine large feathered wall hangings of turquoise and yellow, which reduce the image to two or three large, brightly colored geometric shapes. Dating from the early eighth century, these were found rolled up in ceramic vessels along with more than 60 other wall hangings of probably ceremonial nature.

Mexico and Central America yielded cultures similar to those in South America, but with even more complicated cosmologies. Beginning with the Olmecs in Mexico in 1200 B.C., this was a region of powerful civilizations: the Aztecs whose great city of Tenochtitlán had a grandeur and scale outstanding in this hemisphere and the Mayans whose scientific study of the stars rivaled that of Egypt. Without the rare metals of the Andes but with the mud and rock from craggy mountains and tropical rivers, the artisans of Mesoamerica (a region including south and central Mexico, the Yucatán peninsula and parts of Central America) were highly skilled ceramicists and stone carvers. From Mexico's Colima region come red clay pots shaped in ways ranging from ordinary beasts to the contorted acrobatic position of a man perhaps experiencing hallucinatory visions.

The Mayans, the great Mesoamerican architects of Palenque in Chiapas and Uxmal in the Yucatán peninsula, were also great stone carvers to proclaim the permanence of their myths and history. A scene commemorating what is thought to be the reign of the monarch "Two Wind" can be seen carved on one ten-foot high Mayan stone stela from Piedras Negras, Guatemala, dated A.D. 716. On loan from the Republic of Guatemala, the low-relief stela has the characteristic Mayan figures with elongated heads and large hooked noses. Even rarer than stone carvings is a Mayan wood figure of a seated man, believed by experts to be the only three-dimensional piece of Mayan wood sculpture to have survived the hot and humid Mesoamerican climate.

Mounted high on the wall in the final gallery hang two square stone carvings of Toltec eagles. Shadows cast by sharp lighting on the deep-cut reliefs are like the shapes made by Mexico's tropical sun centuries ago, when the plaques were thought to have been installed on a temple near Veracruz. American artist Frederic E. Church bought the carvings because of the power of the images, and he gave them to the Metropolitan in 1893 to share that beauty.

Nelson Rockefeller never saw the Metropolitan's tribute to the primitive arts to which he was so enthusiastically devoted for almost 50 years. But because of such artists and patrons, the cultures of Africa, the South Pacific and the Americas are now preserved for succeeding generations.

Ceramic Olmec piece, dating from 1100-800 B.C., is oldest Mesoamerican object in the collection.

LTV. Looking Ahead

Does U.S. industry need trade protection? "Realistically, yes..." says Kirkland. "Counterproductive," argues Crandall.

U.S. NEEDS PROTECTION

Lane Kirkland
President, AFL-CIO

"...the cry of protectionism is never raised against protectionist governments; only against U.S. exporters who complain."

As American-flag ships vanished from the seas after World War II, seamen were told this was, after all, a manufacturing nation, not a service nation. Export, not transport, was where the jobs were.

After 30 years of export deficits, it is said the U.S. should emphasize service in its trade policy. The loss of steel plants in Pennsylvania, auto plants in New Jersey, railroad parts in California, shoes and machinery plants in Missouri and electronics, glass, rubber and aluminum nationwide are acceptable because this is a service economy.

Economic diversification only answer

In the eyes of the AFL-CIO, neither of these simple arguments holds water. The United States must be a diversified manufacturing, agricultural and service economy, with a complete range of basic industrial and technological products. Anything less fails to develop the resources and industries this nation needs to provide full employment and rising living standards. That is the goal. Trade policy is one means of pursuing that goal, not an end in itself.

Those who speak of "free trade" as if such a thing still existed talk as if the United States has many barriers to trade and other countries very few. The reverse is true. Other nations have planned economies, import restrictions, export requirements and export subsidies.

No U.S. exporter has free access to the markets in Japan or Brazil, let alone such countries as Romania or the Soviet Union. And yet, the cry of "protectionism" is never raised against protectionist governments; only against U.S. exporters who complain.

These are increasingly in short supply. It is easier to close U.S. plants, open new ones abroad, enjoy protection within these markets and export freely to the United States and third markets. Industry gets every encouragement to do so from U.S. policymakers, who deny help to American producers in the U.S. while deploying an array of subsidies for overseas investments.

Changing the balance

U.S. tax and trade policies have led to a world in which the principal traders are now multinational banks, corporations and governments, often working in partnership, destroying the industrial fabric of the United States while charging the U.S. with "protectionism." As long as this imbalance remains, the losses from foreign trade will be much higher than the gains for most Americans.

What America needs is a fair trade policy that takes account of the real world, in which free trade does not exist.

No country need apologize for giving weight to its own national interest; for the United States to ignore its people's needs is suicidal in the long run.

LOOK BEYOND POLITICS

Robert W. Crandall
Senior Fellow
The Brookings Institution

"...the arguments for trade protection ignore some rather fundamental political and economic forces which severely limit their validity."

Any period of economic adversity creates political pressures for "temporary" protection of domestic industries from import competition. Both labor and management argue that trade restrictions will allow industry to modernize, to reduce unemployment, and to be relieved from "unfair" foreign competition and its effect upon prices. The political appeal of these arguments is obvious. One needs only to look at the protection the U.S. government has given producers of textiles, shoes, clothing, meat, sugar, television sets, steel, and even automobiles.

Unfortunately, arguments for trade protection ignore fundamental political and economic forces which severely limit their validity. First, protection is usually counterproductive. Relieved of foreign competitive pressures, domestic producers are likely to adjust more slowly to economic circumstances. The steel industry has benefited from protection for all but four of the past twelve years. No one can seriously argue that this "temporary" respite has induced the industry to accelerate its modernization program.

Altering collective bargaining

Secondly, it weakens the resolve of management at the collective bargaining table. The most noticeable effect in the steel industry has been the sharp acceleration in its wage rate which began precisely when the first restrictions on steel imports were being negotiated. Now the industry pays $20 per hour for its labor and finds it difficult to compete with the Japanese and Koreans (or even the Canadians).

Perhaps the most disquieting result of trade protection is its permanency. Government cannot know whether it is easing

an industry's temporary problems or creating a permanent ward of the state.

Removing all import restrictions on textiles or apparel is now unthinkable. We should not succumb to pressures for creating similar government wards out of our automobile or steel industries, even if other countries choose to subsidize their failing industries. American workers and consumers are not helped by a policy of sheltering businesses which are no longer competitive.

Finally, we must consider the effect of retaliation by foreign governments on our exporters. Trade protection for our dying and weak industries will reduce the demand for exports from our high-technology and farming sectors as foreign governments are forced to retaliate. We only need to look back on the 1930's to see how such trade policies can convert a recession into a depression. Surely, no one is well served by a trade war.

This is Mr. Crandall's opinion and not that of other staff members or trustees of The Brookings Institution.

WHAT THE PEOPLE THINK

Reported by
Kenneth Schwartz
Vice President, Opinion
Research Corporation

"...people believe that American companies are falling behind..."

How the American public feels about the very sensitive issue of foreign competition is an issue which is not only crucial to the nation's economy, and the LTV Corporation, it is a concern in almost every household.

To gain a better understanding of the depth of these feelings, Opinion Research Corporation conducted a nationwide telephone survey in March of 1,008 people. They were asked, "To begin with—from all that you have heard or read, would you say that American companies are holding their own or falling behind in competition with foreign companies?"

Six in ten Americans believe that U.S. companies *are* falling behind, while 29% think they are holding their own. The other 11% had no opinion.

More importantly, the proportion of people believing American industries are falling behind rises significantly as income rises.

Believe American companies are falling behind in competition with foreign companies	
Under $10,000 family income	50%
$10,000-$14,999	57%
$15,000-$24,000	65%
$25,000-$49,999	68%
$50,000 or more	73%

We next asked if they would favor restrictions on imports. Four in ten of those who see American companies falling behind our foreign competition believe we should have restrictions on some imports. One in five would favor restrictions on all imports.

Percentage of Americans favoring restrictions on imported goods	
Restrictions on all imports	23%
Restrictions on some imports	40%
No restrictions	32%
No opinion	5%

Of those favoring restrictions, the overwhelming majority favor restrictions on automobiles—75%. Other restrictions on goods and services were not so widely mentioned.

In sum, Americans are keenly aware of foreign competition and concerned about its impact on the U.S. economy. They also know that U.S. trade policies will have to change.

WHAT LTV BELIEVES

Speaking for LTV
Paul Thayer
Chairman of the Board and
Chief Executive Officer

"...for the future of American industry to be successful, America must be able to compete equitably."

Open competition is an American legacy. Our nation's industrial success has been built upon that legacy. But, when the world's producer nations each play by a different set of rules, competition alone isn't enough.

American tax and consumer dollars helped make foreign competition as formidable as it is today. We accept that as a fact of business life. What we cannot accept are practices such as the dumping of government-subsidized, foreign-made steel into the U.S. market—steel sold at below the cost of the most efficient producer. In other words, when unfair trade practices are pursued, we believe our government must exercise a restraining hand. In the long run, carefully measured intercession will bolster rather than deter competition.

American business, on its own, must continue to produce more efficiently if it is to succeed in the world marketplace. LTV has recently embarked upon a $400 million capital expenditure program to modernize many of the steelmaking facilities of its steel subsidiary, Jones & Laughlin, the nation's third largest steel producer. This should strongly enhance J&L's ability to compete. Additionally, J&L has benefited significantly from a remarkably effective productivity improvement program.

1981 will be an important year for LTV's Jones & Laughlin steel group and our Continental Emsco energy products and services group. Strong demand for products—drilling equipment/supplies and tubular products—will have a positive impact on our revenues.

J&L is the nation's largest supplier of pipe to the oil and gas industry. Concurrently, new orders for Continental Emsco's drilling equipment are running far ahead of last year. In both cases, as the number of active drilling rigs and pipelines under construction continues to reach record levels, our activities in both areas will also increase.

LTV is dedicated to becoming increasingly competitive in the areas in which it operates—and to the principle of open competition. But for the future of American industry to be successful, America must be able to compete *equitably*. This will require more than hard work and capital investment. It will require U.S. and international trade policies that truly recognize the world marketplace as it exists today, and provide protection and fair play for *all* the participants. The end result will be a more balanced industrial environment. And that will benefit the *consumer* as well as industry.

The LTV Companies: Jones & Laughlin Steel, Continental Emsco Company, Vought Corporation, Kentron International, Lykes Bros. Steamship Co., Inc. *To receive the LTV Issues series through the mail, write LTV Issues, P.O. Box 225003-6E, Dallas, TX 75265*

LTV The LTV Corporation
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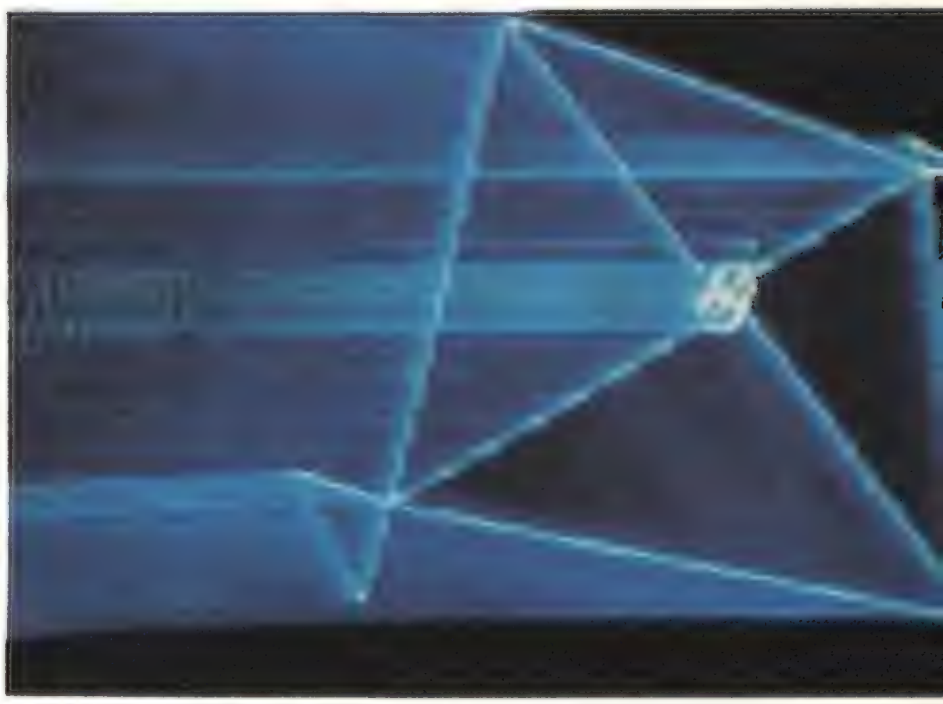
By Eric Drexler

Sailing on sunlight may give space travel a second wind

'Lightsails' made from super-thin aluminum could travel the solar system and beyond, and bring back precious payloads from space



A solar sail in flight, powered by the pressure of sunlight, is depicted in this computer simulation.

As the sun sinks from sight one summer evening in 1992, a spark appears in the fading light, rising and moving east. Faint at first, it climbs toward the zenith, shrinks to a line, then opens to a hexagon of light, slowly turning, sweeping across the sky to redden and vanish in the shadows of the east. The next night, it comes again.

As night follows night, the hexagon shrinks to a dot, then to a point drifting slowly across the sky circling higher and higher, now above both Earth and its cone of shadow. At last it vanishes, no longer circling, a fading glint among the stars.

Five centuries after Columbus, the hope of treasure calls once more and a ship sets sail for distant shores. And again, the ship has sails.

But why, one may ask, should a spaceship use sails? On the seas of Earth, engines replaced sails generations ago, and engines of awesome power launch our spacecraft today. Sails will work in space: Einstein showed that energy has mass, and the energy of light exerts a force when it bounces off a mirror. The pressure of sunlight, however, is terribly weak; using sails to replace rockets in space may seem a step backward.

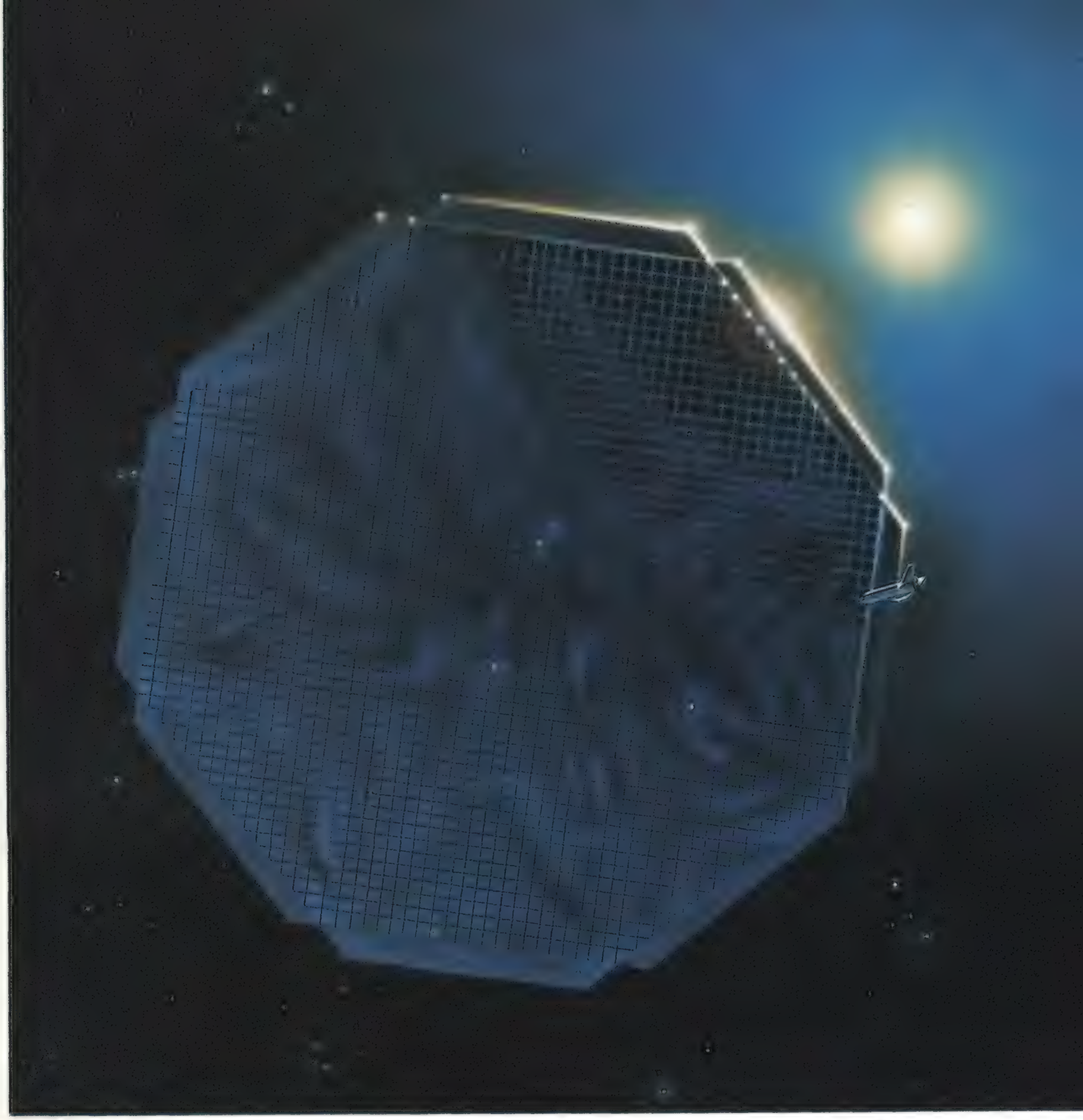
Rockets are as old as Chinese fireworks, far older than the *Star-Spangled Banner*. They are compact, powerful and useful to the military. Unlike sails, they can punch through air and fight strong gravity. In the 1930s (and earlier), those who troubled to examine the technical facts knew that rockets could lift people to the moon. Rockets had a head start over sails, and rockets were needed for the first big step in space travel, the step off our planet.

Project Apollo with its first "moonwalk" was a triumph so great that it seemed to be what "the space program" was all about, yet the triumph was hollow because it led nowhere. The voyage of Columbus opened a frontier by sailing to new lands in a reusable ship. Apollo virtually closed a frontier by surveying a wasteland in a throw-away machine built at a very great deal of expense.

After Apollo, robots with cameras, launched to the planets, replaced the dream of a jungle-clad Venus with the reality of a vast oven of high-pressure poison; they erased the network of lines drawn by Earthbound astronomers on the deserts of Mars, and with them went both canals and Martians. The robots drew a

A half-size prototype of a solar sail is spread on California high school gym floor, dwarfing designers.

Photographs by Wayne Sorce



A variety of future solar and Lightsail structures are shown in transit in Rick Sternbach's illustration, with solar glare and halo, the Earth and moon in the background; in left foreground is space shuttle.

Mars of craters and canyons and dry blowing dust. Sunward of Venus lay the baked rock of Mercury; starward of Mars lay rubble and ice. The planets ranged from dead to murderous, and the dream of new Earths receded to distant stars.

Yet even as the old space program has shriveled and planetary launches have ground to a halt, new opportunities have come into sight. Today, we have a shuttle and we know more about space and our own abilities. Where attention once focused on planets because they were big and bright and somewhat like Earth, people now realize that an asteroid or two could fill the factories of Earth with raw materials, brought back by Lightsails, built in orbit, that soon may be able to shuttle endlessly around the solar system, using no fuel at all.

Although rockets have been used for ages, light pressure has been known for scarcely a century. The source of the idea of using mirrors as sails to catch sunlight remains blurred. James Clerk Maxwell described electromagnetic fields in the 19th century; his equa-

tions indicated that light exerts a force when it reflects off a mirror. In 1924, Sir Arthur Eddington showed that light pressure helps keep stars from collapsing under their own weight (the light from our sun could support a weight of more than 100 trillion tons), and in that same year two Russians, Tsander and Tsiolkovskiy, suggested using sunlight to drive large mirrors through space.

Independently, Carl Wiley published the first factual article on solar sailing in English: "Clipper Ships of Space," in the May 1951 issue of *Astounding Science Fiction*. Seven years later, when the door to space had opened a crack, Richard Garwin published a technical article on sails in the March issue of *Jet Propulsion*. Wiley looked to a day when sails would be built in space itself, but the technical literature since Sputnik has followed an understandable direction. Since the only way to get into space is in the nose of a rocket, sail designers aimed to stuff a sail into a small, rugged package, and to have it spring unaided to full size in

Researcher displays a swatch of solar-sail material; final structure requires enough to cover football field.

space. Since the force of sunlight on a mirror the size of a football field amounts to the weight of a small marble, a sail must be both big and light to give a useful cargo a reasonable acceleration. To survive packaging, launch and deployment, the reflector for such a sail must be flexible and tough. Designers settled on aluminized plastic as the best choice. Workable designs emerged. Their projected performance improved with time. They were no use, however, in a crash program to reach the moon, and available rockets could always launch the next robot toward the next planet. Interest waxed and waned, but no sails were built. [In 1964, Arthur C. Clarke wrote a short story for *Boys' Life* magazine, which described a race to the moon by a handful of "sun-yachts" from both Earth and Mars. One of the entries, *Diana*, with her "two square miles" of sail and nearly 100 miles of rigging, is running neck and neck with the Soviet ship until a solar storm abruptly cancels the race. *Diana*'s skipper abandons ship, knowing the "sunjammer" can "look after herself"—and become "the first of all man's ships to set sail in the long journey to the stars."]

Around 1974, interest waxed again. First Jerry Wright, then Chauncey Uphoff, Louis Friedman and Bruce Murray at the Jet Propulsion Laboratory (JPL) in Pasadena, California, became interested in sails. Jerry Wright discovered a way to fly a sail to Halley's comet, one of the most spectacular and inaccessible objects in the solar system. At the JPL and elsewhere, groups began to design sails able to fly the mission. They developed designs for plastic-film sails of high performance and worked out ways to spread them in space. Meanwhile, others interested in the Halley mission designed a competing system using electrically powered rockets. The two systems (both launched by conventional boosters) had comparable performance, but the National Air and Space Administration decided to favor the rocket over the sail, then scrapped the mission for lack of funds. This time, however, interest did not fade—it shifted. After years of trying to get NASA and Congress to support a program to develop a sail, designers and their supporters have decided to give up—and build one themselves.

The Solar Sail Project of the nonprofit World Space Foundation in South Pasadena has begun construction of a kitelike plastic-film sail. Project members have built spars and sail material on special machines, and have tested deployment procedures. Their first prototype will be about 14 meters on a side and the second 28 meters. Support has come from many private sources, including technical assistance from JPL, computer time from Thagard Oil, and money from foundation memberships and the Charles A. Lindbergh Fund in New York.

Another approach, which I have proposed, is to build a kind of solar sail, called a Lightsail, directly in space. If you imagine a network of carbon-fiber strings, a spinning spiderweb kilometers across with gaps the size of football fields between the strands, you will be well on your way to imagining the structure of a Lightsail. If you imagine the gaps bridged by reflecting panels built of aluminum foil thinner than a soap bubble, you will have a fair idea of how it looks: many reflective panels tied close together to make a vast, rippled mosaic of mirror. Now picture a load of cargo hanging from the web like a parachutist dangling

Eric Drexler is with the Space Systems Laboratory at the Massachusetts Institute of Technology and is now writing a book on technology and the future.

from a parachute, while centrifugal force holds the web-slung mirror taut and flat in the void, and you should almost have it.

Lightsails are what solar sails seem likely to become when we build them in space. They differ considerably from the deployable, plastic-film sails designed for launch by rocket from the ground. (Lightsail is a more accurate term because "solar sail" suggests a craft using the solar wind, a weak stream of gas that flows from the sun with little effect on sails.) Not needing the toughness to survive folding, launch and deployment, Lightsail reflectors need no plastic backing tens of thousands of atoms thick: they can be unbacked aluminum films just a few hundred atoms thick. Such thin foil cannot be made by smashing a bar of aluminum between rollers, as kitchen foil is made. Instead, thin films are made by piling up atoms on a smooth surface. In vacuum this is easy, and space has vacuum to spare. In vacuum, hot aluminum evaporates; atoms fly off, run into things and stick. After a time, a film of metal builds up. The only problem is getting it off the surface and onto a mounting without tearing it.

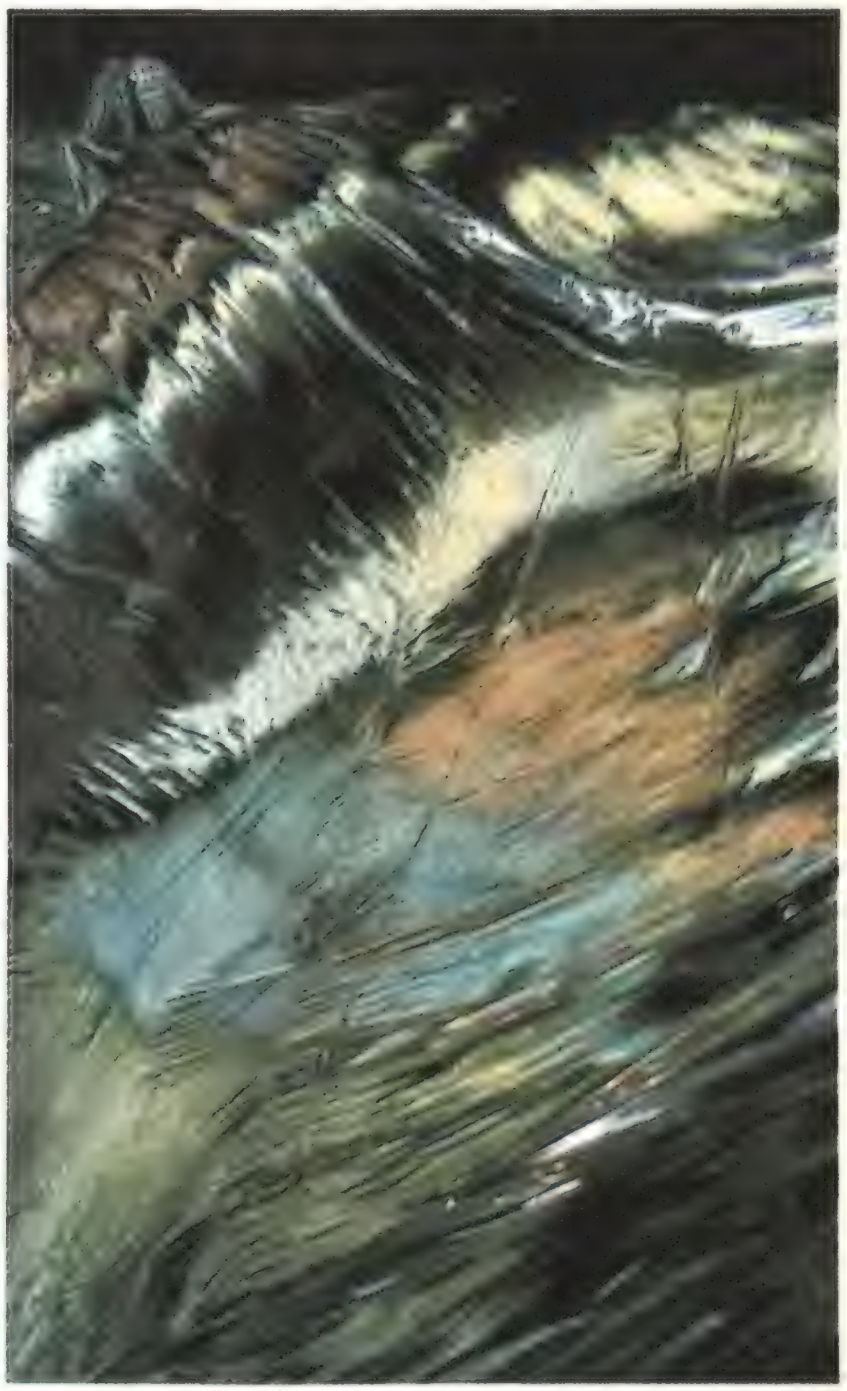
Early in my work on Lightsails, I learned how to make thin films, to convince people (me, for example) that foil several hundred times thinner than kitchen foil could be made and handled. The process is simple, even on Earth, and had been developed by scientists doing basic research on other matters.

A simple process starting with a little detergent . . .

To make thin metal films (p. 60), first take a glass miscoscope slide and smear it with detergent (some kinds work better than others). Let it dry, then wipe off all that is visible, leaving behind an invisible film. Then place the slide in a vacuum chamber and pump out the air. Next, run current through a tantalum strip in the chamber, until it glows white, to vaporize a bead of aluminum from its surface. This turns the slide and the vacuum-chamber window into instant mirrors. Finally, remove the slide and dip it slowly in water, which will creep under the metal film, following the detergent, with the result that the film floats off to turn a rectangular area of water into a smooth, rippling reflector.

Pieces of film may then be scooped up onto aluminum-foil frames to show off. Others may be waved through the air, shaken or tormented with pins, to get a sense of their resistance to tearing: if thick enough, they prove delicate but can be handled. To the eye these films look like plain, shiny foil, except for two differences: where they have wrinkles, the wrinkles are fine, and whenever the air around them shifts, the wrinkles shift as well. They should shift, since such films have less mass than a slice of air a third of a millimeter thick. A piece of film rubbed between fingers coats them with sparkling dust.

Lightsails have little mass because they use unbacked reflectors and a structure of tension members. Tension members are lighter and slimmer than compression members of similar strength: compare a tower 20 stories high with a rope 20 stories long, if each supports a ton. This combination of reflectors and structure makes Lightsails 20 to 80 times lighter than deployment plastic-film sails. This low mass cuts the launch cost and increases the sail's top acceleration by the same factor. One shuttle payload could supply materials enough to build a hundred square kilometers of reflectors and structure, divided among a few dozen sails, yet these sails could be run through a trash compacter and be stacked in a fairly spacious



A member of the sail team lifts an edge from gym floor, producing billowing waves in the ultrathin Mylar.

Team folds sheets of Mylar like an accordion bellows for launch in space shuttle, to be unreeled in orbit.

closet. The cost of this performance is the construction of a system able to build sails in orbit, but the needed machines could apparently ride up in just a shuttle launch or two.

Because Lightsail technology pushes no limits, whether on stress, temperature or precision, engineers can have confidence in its feasibility. Though light, the reflectors and structure are far stronger than they need be to hold together under the mild stresses of flight in space. Concerns such as heating and micrometeoroid damage have been examined and pose no threat to a properly designed sail. The manufacturing facility is small and simple compared to existing factories on Earth. If we plan to use space, we must learn to build in space; building Lightsails may be a good way to start because Lightsails can help open up the solar system.

Compare a Lightsail with an ordinary rocket. A one-ton rocket could push a cargo pod weighing more than a ton to a kilometer per second in a few minutes. A one-ton sail (more than a mile wide) would take all day to reach the same speed with the same cargo. But the next day the rocket would coast, drained of fuel, while the sail would add another kilometer per second to its speed. Accelerating just over one-thousandth as fast as a falling brick, it would pass 20 times the speed of sound (in air) in less than a week. Worse yet for rockets, a two-ton rocket cannot double the speed of the one-ton rocket because the extra fuel would burden it. Indeed, every three kilometers per second added to the final speed of the cargo roughly doubles the mass of the required rocket, but adds just three days to the acceleration time using a sail. Since solar-system journeys, by rocket or sail, will generally take months to years, sails have a strong advantage: not only is the sail reusable for decades, and never in need of refueling, but also on any given flight around the solar system it will generally be both lighter and faster than the competing rocket, whether that rocket is chemical or electric. Rockets beat sails at giving swift kicks, but in the long haul they run out of gas and then can only coast along.

The mighty engines of space gobble fuel in a way that steamships never did, and sails in space have other advantages over their relatives below. At sea, the winds shift, stop and storm unpredictably. In space, the "wind" is sunlight, and holds quite steady. At sea, winds give a ship a steady speed. In space, the "wind" blows at the speed of light and the "hull" has no drag; thus, speed can increase while light still strikes the sail. On seas of such vastness, high speeds are essential—circling the sun along Earth's orbit would take more than a century at the speed of a jet airliner.

At sea, mere sails are not enough; seagoing ships have keels so they can tack to go upwind. Lightsails have no keels and do not tack, yet they can manage. Light pressure can never pull a sail toward the sun, but the direction it pushes can be steered from side to side by tilting the sail, while gravity provides a steady pull inward. This steerable push and steady pull combine to move the sail in any direction chosen, from any orbit to any other, so long as it remains beyond reach

A spar, to serve as structural support for sail, is wound around a reel for compactness during launch.

of the drag of an atmosphere or the roasting of a close solar approach. At sea, ships have wind and water; in space, sails have light and gravity.

Since Lightsails spin like a gyroscope, a Lightsail requires a steady twisting force to turn it to a new orientation. The sail can turn itself in two ways: it can shift the cargo off axis by reeling and unreeling the connecting lines, or it can tilt its reflecting panels to shift the distribution of light pressure. The first turns the sail swiftly, for maneuvers near planets; the second turns it slowly, for maneuvers in orbit around the sun. In solar orbit, the sail can spin in one orientation for weeks at a time without moving a motor. Any panel can jam in any position with little effect, since there are so many of them; thus sails should run for decades without repair.

Lightsails change space because they open new opportunities there. They can carry robots to the planets in record time or haul satellites from low to high orbits. They can do far more, however, because they should cost far less to use than any rocket on the drawing boards. Estimates of Lightsail-production costs remain crude, but space engineers have a tradition of estimating masses, guessing costs per pound, multiplying the two together, and assuming that the result is in the right ball park. This works fairly well, for ordinary equipment. Knowing the cost of equipment (and the interest rate, the cost of supplies and such), one can estimate the cost of the product even if the product is novel. Based on these methods, Lightsails are estimated to cost as much as household aluminum foil per square foot (but much more per pound!). If so, they can drop the cost of traveling through space to a dollar a pound, or less. Since this cuts current costs by a factor of a thousand, it means a revolution.

The asteroids are different

Today, the solar system seems vast and inaccessible. But our sense of the size of the solar system reflects, in part, our sense of the cost of going places with rockets. From this viewpoint, developing Lightsails would be somewhat analogous to moving everything in the inner solar system to a thousand-kilometer orbit above the Earth, just outside the fringe of the atmosphere.

Among the most important changes would be access to asteroids. The planets themselves will remain deadly deserts, their gravity blocking access by Lightsails and handicapping industry. Planetary atmospheres block solar energy, spread dust, corrode metals, warm refrigerators, cool ovens and blow things down. Even the airless moon rotates, blocking sunlight half the time, and with gravity enough to ground a Lightsail beyond hope of escape.

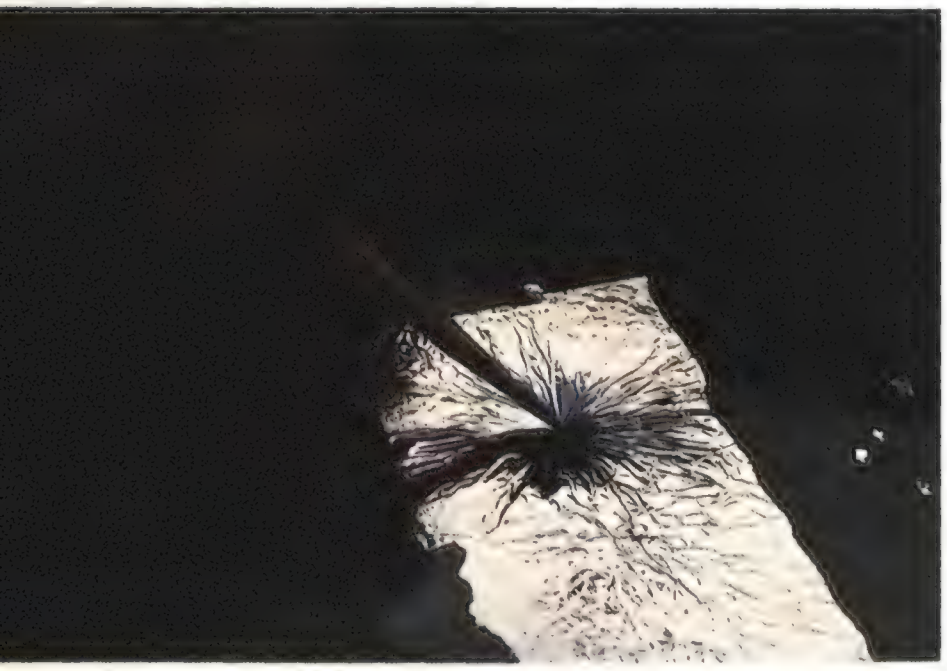
The asteroids, however, are different. They are tiny by planetary standards, and their orbits crisscross the solar system. Some cross the orbit of Earth, and some have hit it. Since the asteroids are small, their gravity is easy to overcome or ignore. They hold no atmosphere to interfere with industry (or to be polluted by it), and the steady sunlight of free space lies near at hand to power equipment and heat furnaces. There, too, Lightsails can stop to retrieve precious cargoes, for many asteroids hold more than mere rock. Some contain water, and hydrocarbons like oil shale, to feed space industry.

Better yet, in some lie exposed metals of kinds made scarce here ages ago, elements that sank in the formation of Earth's metal core. Meteoritic steel, for example, is a strong, tough alloy containing nickel, cobalt, platinum group metals and gold. A kilometer-wide chunk of this material contains precious metals worth more than a trillion dollars, mixed with many years' supply of nickel and cobalt for the entire world. Raw materials from the asteroids can provide most of the needs of an industrial civilization.

Still, the cost of space launches may make the idea of mining raw materials in space seem absurd. But consider another perspective: what is the cost of bring-

First step in making superthin aluminum film occurs in vacuum where material is evaporated onto glass.

As glass is submerged in water, the adhered aluminum film separates from its surface and floats in the pan.



Aluminum film on water's surface is just a few hundred atoms thick, but resists toothpick's pressure.

ing down a meteorite? Nothing, of course: they fall by themselves, free samples from asteroids. Launches take rockets, but plain rocks know how to fall. Material, once gathered and guided to Earth, need cost little to bring down. Since it makes scarcely more sense to bring back a whole asteroid than to bring back the moon, the chunks should be small. Since things can be dropped with pinpoint accuracy (and since landing zones like salt flats are often large), returning material can be safe. Lightsails could bring robots and refining equipment to an asteroid and return treasure beyond the dreams of Cortés.

A Lightsail program could build on itself. Lightsails need not use aluminum reflectors, they can use metals returned by earlier flights. With asteroidal metal and a modified evaporator, the fabrication facility could build cheap freighter sails using little material hauled up from Earth. Such sails might cut the cost of space transportation so low that asteroids could be mined for ordinary steel.

In time, principles used in a sail for hauling a satellite can serve in a sail large enough to haul an ocean liner to Mars in less than a year. In time, Lightsails can team with lasers to drive starships. A sail pushed by sunlight can leave the solar system in less than two years, its speed climbing past 100 kilometers per second before the sun fades astern. A large laser orbiting the sun could better this, pushing the sail with its beam of light far out into the interstellar darkness, pushing the sail toward the speed of light. The only problem then is stopping. Freeman Dyson of the Institute for Advanced Study in Princeton suggests drag brakes using the interstellar plasma; Robert Forward of the Hughes Research Laboratory in California suggests using light from the laser bounced off the sail to decelerate a smaller mirror as a "brake." One way or another the stars themselves lie within reach of sails.

Today, Earthbound governments growl at each other, threatening nuclear war over the limited resources of a single planet. Perhaps the greatest promise of space is the perspective it provides: that to fight over the resources of Earth is to fight over crumbs.

For a nation interested in prosperity and in peace, the challenge of space cannot be ignored. European, Soviet and Japanese efforts in space have grown even as the U.S. space budget continues its post-Apollo decline, and even the leaders of these countries still act as if the Earth were the whole "world." Perhaps, after 500 years, it is time the Copernican revolution came to global politics.

Author Drexler displays aluminum film adhering to his palm. In space, such film could sail to the stars.

THE MOST UNCONVENTIONAL CONTINENTAL IN FORTY YEARS IS ONE OF THE FINEST RIDING CONTINENTALS EVER

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LINCOLN-MERCURY DIVISION Ford

The very model of a philanthropist, Henry Huntington, as painted by Sir Oswald Birley.

The art gallery, built as the residence in 1909-11, was in style popular among millionaires at that time.

By Michael Olmert

Truth and beauty are still in flower at the Huntington

A California philanthropist and his wife made their home, library and garden into a showcase for the rare and the exquisite

There is a certain question I feel compelled to ask the director of every museum or gallery I visit. The question goes something like this: "If the building catches fire, which items will you grab as you dash out the front door?" The question, I know, is tiresome. But worthwhile. After a round of apologies from me and disclaimers from my victim, it usually works its magic and the real masterworks of the collection begin slowly to emerge.

There was a different kind of answer, however, when I put the question to James Thorpe, director of the Huntington Library in San Marino, California: "Actually, I don't believe I'd go for any of the *things*. I'd rather take out a few of the great *people* we have around here." A fair answer. And no mean one either, considering the priceless nature of so many of the Huntington's *things*: a Gutenberg Bible, the world's most important Chaucer manuscript (the so-called "Ellesmere Chaucer"), Gainsborough's *Blue Boy,* Sir Thomas Lawrence's *Pinkie*, and countless others.

I was startled and delighted with Thorpe's unusual response. For although the Huntington holds a world-

Formidable grande dame Arabella Huntington struck this magisterial pose for her portrait, also by Birley.

class collection of books, paintings, drawings and even plants, its people and the Huntington style make all the difference. It is these people, either in the library's reading room or in the art gallery, who make the Huntington what it is, something more than a highly distinguished repository of great things from the past. It is of course that, but it is also a center for research in English and American letters, in English portraiture, in desert and exotic gardening. Indeed, the late historian Joel Hurstfield likened the academics working at the Huntington to a group of miners picking away at a lode of undiscovered knowledge: the reading rooms, said he, are "the coal face of real research."

Under the 15-year directorship of Thorpe, an ex-English professor and dean from Princeton, the Huntington is amazingly robust. An eight-million-dollar renovation, building and expansion program extending over the last four years has resulted in the completion of a new educational and orientation center. An active acquisitions program is daily adding materials for new studies in English drawings and sculpture, 20th-century American literature, the history of science, and jungle and bamboo plants, to name a few newcomers. About 400,000 visitors a year troop through the gates to see the place.

What do they come to see? The Huntington collection is in three parts, each of considerable stature: the library, the art gallery and the gardens. This tripartite assemblage began to form at about the turn of the century under the direction of a wealthy railroad executive, Henry E. Huntington (1850-1927), who first came to California to help his uncle, Collis Huntington, run the Southern Pacific Railway. He quickly, however, spurned the foggy San Francisco area in favor of the climate and crystal air of the San Gabriel Valley, an Eden jealously watched over by Mt. Wilson and Mt. Baldy, and dotted with tempting citrus, apricot and peach groves.

In 1902 he bought a 600-acre ranch in San Marino, which he aimed to make the center of his operations. He built a mansion to allow him to live comfortably among his books and art. Huntington, in fact, was that most rarefied of species, the tycoon who enjoyed the fruits of his wealth. There is evidence that

An average of 60 scholars a day come from the United States and foreign countries to use the superb library.

he actually read and loved the books he had collected.

Henry E. Huntington also had taste. He collected only in depth and only in certain circumscribed areas. Not a little of everything, but the best in a few selected areas. The institution he founded has steadfastly followed these guidelines for more than 50 years.

In time, Huntington was to become the greatest American book collector, whose library became the greatest independent research library in the United States. A few figures: about six million items, nearly 600,000 rare and reference books; five million manuscripts; and 5,400 incunables—that is, books from the "cradle period" of printing, from 1455 to 1501.

Contemporary photographs show him as an imposing bald-domed figure in black, often peering at his beloved books. But the most amazing thing about the man was his taste and devotion to scholarship. Although he had no college education, his literary decisions were seldom wide of the mark. He was an early buyer of first editions of H. G. Wells and Joseph Conrad, for example—well before their literary reputations were even remotely secure. He also had a very early collection of William Blake drawings, largely to support his interest in Blake's poetry.

Actually, it was his relationship to his uncle's widow, Arabella Huntington, that prompted Henry to collect art in earnest. Arabella was a grande dame of New York City, with a mansion at the corner of Fifth Avenue and 57th Street (on the site of today's Tiffany & Co.) that was chock-full of art, including at one time the haunting Rembrandt, *Aristotle with the Bust of Homer*, bought in 1961 by the Metropolitan Museum

Author Michael Olmert lives in Annapolis, Maryland. A teacher of medieval literature, he writes a column, Points of Origin, for SMITHSONIAN.

of Art for $2.3 million and, as it turns out, a bargain. She was widowed in 1900 and gradually became linked with her husband's nephew. Their common interest: the pursuit of art. But Henry seems to have bridled her rather catholic instincts for collecting, and quietly moved their acquisitions in the direction of British art, supported only by other European examples when they served as a source or model for English artists. Still, it is her interest in art that cemented their relationship. Some scholars insist that there might be no Huntington art collection today if it were not for Arabella's inspiration and determination. Not for nothing did she habitually dress in black, and insist on being painted in 1924, the last year of her life, in an unflattering pose dominated by a withering gaze through a pair of no-nonsense black-rimmed spectacles (p. 65). Indeed, it is hard to reconcile this portrait with the merry widow who was reported by a Parisian correspondent in 1901 as having "developed quite a craze for automobiling" and was ticketed by the gendarmes for speeding.

A parade of friends and associates

After a decade of close friendship and collecting (HEH spent two million dollars on art between 1907 and 1909), Arabella and Henry were married in 1913. Henry set about to make "the ranch," as he called the San Marino estate, into a home, a refuge and a showcase for their things. In 1919 the Library, a separate building on the estate, was opened to visiting scholars (opposite). Through the following years, Henry was fond of parading friends and business acquaintances through both his home and the library to see the paintings and books.

This custom was frowned on by Mrs. Huntington, who often hid herself away during these grand tours. She disliked living in a fishbowl, and actively discouraged scholars from keeping Henry up till all hours of the night discussing Shakespeare and Tennyson. One night she sent a servant to whisper, none too subtly it appears, in a visitor's ear that it was time for Mr. Huntington to retire.

Arabella died in 1924 and HEH in 1927—but not before he established a permanent library endowment to enable scholarship and acquisitions to continue at the ranch for years to come.

It exists as such to this day, still supported from the original Huntington money for two-thirds of its budget. One-third is annually sought and received from private and corporate donors and the general public.

The Huntington now stands as the crowning civic attraction of the affluent residential town of San Marino, a genteel southern neighbor to bustling Pasadena, in the great Los Angeles basin. Today's 207 acres encircle two major buildings. The elegant mansion now houses the art gallery and art library. The larger structure, the library, was planned by Huntington himself to have translucent glass floors in its book stacks, and was designed to resist seismic shock by having the vast rare-book stacks stand free even though the floors might fall away. New wings on the original library building house administrative and curatorial offices, as well as a bold new visitors' and educational center. Another recent innovation is the parking lot, which is surely the most attractive in the world, gloriously planted as it is with avocado and eucalyptus trees, with rare herbs and plants. It seems fitting that

Interior view of art gallery, which houses a choice collection, including the *Blue Boy* and *Pinkie*.

The library is one of the world's greatest research resources; exhibition hall shows 200 treasures.

This page is from the Huntington Gutenberg Bible, one of the 12 surviving copies printed on vellum.

The Ellesmere Chaucer, considered the most beautiful of all manuscripts, contains this portrait of the poet.

Symbolic engraving represents Mars and Mercury in a 17th-century book—a kind precious to scholars.

Huntington should be so civic-minded and concerned with cultural enrichment for his beloved Southern California. One of Henry's major enterprises was the so-called Big Red electric cars that were the staple of interurban transport in the region up until the 1940s. The freeway mania which began then ended all that. Thus, the parking lot.

Presiding over all this is James Thorpe, by trade a textual scholar (p. 72). That is, he occupies a rather deserted branch of the tree of scholarship, one that is inhabited by people who study the effect of changes in manuscript and typography on the interpretation of literary works. Example: a famous writer once made a big deal out of the fact that Herman Melville referred to the "soiled" fish of the sea. Well, that was the line until a watchful bibliographer pointed out that Melville never actually wrote "soiled" at all. The word was a typographical error for "coiled" fish. Melville was thinking of eels.

Thorpe still finds time for scholarship and literary pursuits, but he enjoys other delights as well. Like the realization that his place is home to not only hummingbirds and century plants, but also a number of small animals, deftly defying the odds of survival in an otherwise resolutely urban setting.

The gardens and botanical projects are directed by Myron Kimnach, a 19-year veteran of the Huntington, a past-president of the Cactus and Succulent Society of America. Kimnach's charges are some 9,000 species of plants—more than 100,000 specimens, arranged about the 207 acres in discrete settings such as the desert garden, the jungle and palm gardens, the Australian garden, the lily ponds, and the Zen and Japanese gardens. There are also special gardens for roses, camellias and herbs. The plants mentioned in the

William Blake's illustration of a passage in Milton's *Paradise Lost* is entitled *Satan, Sin and Death.*

Thomas Lawrence's portrait of Miss Sarah Goodin Barrett Moulton was immortalized as *Pinkie.*

works of Shakespeare have their own special corner, watched over by a bust of the Bard.

But clearly the highlight of every first visit to the grounds is one's initial stroll through the mysterious and threatening desert garden. In this living world of improbable colors and shapes, 2,500 species of xerophytes (plants specially adapted to live with little water) present a distinctly otherworldly appearance. It is easy to imagine you are an astronaut here, crash-landed on a totally alien landscape: no leaves, red lava rock underfoot, and a paranoia of needles and pincushions all round. Indeed, it is not mere paranoia, since the milky white sap of many of the euphorbias (tree-like succulents from Africa) is toxic.

Here are the pincushion cacti (*Mammillaria*), glowing like undersea coral profusely among the rocks. There, the smallish members of the Crassula family take their curious shapes: rosettes, cankerous-looking shrubs, and laughable sedums as ground covers. *Sedum burrito*, for instance, spreads out like a parade of waxy green jelly beans. This particular sedum was discovered by Kimnach on a collecting trip to Mexico and has since been propagated by the Huntington into a best seller at its annual plant sale. Adorning our cover is the South American Easter lily cactus (*Echinopsis*).

Of course, the conventional wisdom is that fanciers of cacti and succulents prize their darlings for their unadorned grotesqueness. *Ariocarpus* is a popular cactus that does its utmost to uphold the truth of that adage. These are the "living rock" inhabitants of the deserts of Texas and Mexico—gray and beige, warty tubercles that barely nudge their way above the soil. A specimen the size of a quarter may have taken 25 years to achieve that diminutive scale.

But to judge the gardens of the Huntington by a visit to its desert plantings alone would be a mistake. The impulse behind Huntington's interest in horticulture was to make his ranch as prosperous and lush as possible. He quickly acted to expand the ranch's income by adding new plants. Thus, the San Marino ranch had Southern California's first commercial avocado grove. With that success, Huntington began a drive to gather plants from around the world to discover those species that would survive and prosper in the semiarid climate of the region. For years a constant parade of plants, cuttings, and seeds made its way to the San Gabriel valley.

Such collecting continues to this day, as men like Kimnach and others under his direction have dangled into many a perilous Mexican canyon to bring back just the right specimen. The object is twofold: to propagate the plant and to codify it for the Hunting-

ton's extensive herbarium. Today, one of the truly astounding collections is that of the Huntington cycads, a squat, palmlike tree, which in fact is no palm at all but a not-too-close relative of the conifers. HEH himself was transfixed by the plant's antiquity as well as its beauty. In prehistoric times, they apparently covered the Earth. Indeed, most of the world's oil deposits originated from decaying masses of cycads or their relatives. Today one views the Huntington's cycads, some of which are a century or two old, with a distinct sense of apprehension, half expecting a bemused dinosaur to poke its head through the fronds. After all, if these plants from the Mesozoic can survive, why not a few animals as well?

Instead of instant saurians, however, in these gardens one is much more apt to find a scholar or two. Take, for example, the University of Pennsylvania English professor Roland M. Frye. For six months recently he was at the Huntington looking into the visual and iconographic background of the works of Shakespeare and Milton. After lunch and at midafternoon, he usually seeks out a solitary bench in the checkered shade to review his notes on the day's research.

As an example of the kind of thing that scholars are able to do so well at the Huntington Library, consider Hamlet's reference to his father as the very model of a good king, a combination of Mercury and Mars. Roland Frye had always let the comment pass as simply a poetic reference to a sort of golden mean. At the Huntington, he came across a small volume of verses and pictures (wood engravings) called *The Mirrour of Maiestie*, published in 1618, not long after the 1600 date usually assigned to *Hamlet*. There Frye saw the popular model of the perfect king, whose right side bears the armor plates, cuirass and kirtle of the warlike Mars, and whose left side has the winged helmet and boots of Mercury (p. 68). The implication is clear: the aggressive and martial right should be neatly balanced by a cautious and circumspect left. A reading of the play today shows us a Prince of Denmark who spends most of his time trying to reconcile these two aspects of his young personality. "The usefulness of this brand of research is obvious," says Frye. "There is no reason that the job of interpreting this play should be a purely literary or textual exercise. From the iconographic evidence offered by popular books of the period, we can see that Shakespeare's public would have immediately warmed to Hamlet's predicament. They knew exactly what he meant by the Mars/Mercury combination. At least some of them may have seen this very illustration, or one like it."

The lanky, engaging Frye is but one of some 1,400 scholars from around the world who make the trek to San Marino each year seeking the answers to literary and historical questions.

In a like manner, the Huntington Art Gallery is prized not only for the beauty that hangs on its walls (p. 67). Also important, it is a center for scholarship in British visual arts. The collection includes English watercolors, decorative arts, miniatures and silver, as well as a surgically clean prints and drawings room (open only to researchers).

Once a family collection

The fact that the Gallery is located in the old Huntington mansion emphasizes the fact that this was once a family collection and not a world-famous museum. Many delightful little touches help retain the sense of a private collection. In what used to be the dining room, a Gilbert Stuart portrait of George Washington (one of 70 repetitions of the famous painting from life) solemnly looks down on a Turnerelli bust of King George III (1815). And art with a family theme abounds, as indeed it did among the patrons of 18th-century England. A favorite and recent arrival here is one of the world's best paintings by Romney: his portrait of *The Clavering Children* (1777) with their two frisky spaniels and cuddly pup. But the picture is so much more than just another Alpo commercial, as it is often taken for today. Viewers are so overwhelmed with the freshness of this portrait that they usually overlook the classical perfection of the modeling and drapery of the figures. Which I suppose is exactly the charm of "classical perfection" in the first place—it is supposed to be overlooked.

Indeed, children are a special focus of the collection. Gainsborough's *Blue Boy* hangs in the Huntington main gallery directly across from Lawrence's *Pinkie*. They are quite a pair. Because they are among the most popular and frequently reproduced paintings ever, you will be forgiven if you expect them to be a bit

This vista from the art gallery is bordered by camellias and azaleas, palms and sculpture.

Moon or drum bridge section of Japanese garden; it has served as background for several movies.

The 12-acre desert garden contains some 2,500 species, including golden barrel cacti, in middle ground.

more saccharine in person (so to speak). The surprise is, that is not the case at all. Great art like this has a way of riveting all those who come before it, no matter how predisposed they may have been to snickering. The brilliance of these two artists will enable young Master Jonathan Buttall and Miss Sarah Goodin Barrett Moulton, both over 200 years old, to live forever.

Gainsborough admired the 17th-century painter Van Dyck more than any other artist. The pose, the format, and the costume worn by Jonathan Buttall in the *Blue Boy*, painted about 1770, are all reminiscent of Van Dyck. In addition, one story has it that Gainsborough used the color blue in this portrait to disprove an artistic theory advanced by his contemporary and rival, Sir Joshua Reynolds. A respected and revered 18th-century art critic, as well as one of its most notable painters, Reynolds maintained that a cool color, such as blue, should never be the dominant area in a painting. Whether or not Gainsborough took this as an artistic challenge we may never know, but his blue portrait succeeded admirably.

By contrast, Lawrence's commission to paint *Pinkie* was a straightforward one. (The painting's title is derived from the nickname of the child, by the way, and has nothing to do with the color.) The request for the picture came from the girl's doting family living in Jamaica; they had sent the young girl back to Britain for her education. In spite of these unremarkable circumstances, something magical happened. Scholars can only speculate about the delicate and enticing dance represented by her left hand and right arm. Was it a secret signal between the child and her grandmother (the actual patron of the commission)? Note how the figure seems to levitate above the landscape. Has she drifted in from the sea like some pristine 18th-century Venus? The painting was likely finished in the winter of 1795, and on April 23 Pinkie died, a victim of tuberculosis. There is no record that the painting made the trip to Jamaica.

The heartbreak in such a story is undeniable. But leaving such biographical details aside, *Pinkie* and *Blue Boy* come across as emotionally vibrant works of art, startling in their virtuosity. Looking at the originals of these works today at the Huntington, I find it hard to account for them as clichés. Which is exactly the point about great galleries. Reproductions are fine for teaching and a kind of second-hand familiarity. But the real thing is available only through a one-to-one encounter between active viewer and painting.

Pinkie was purchased by Henry Huntington in 1927. It was to be his last major purchase before he died in May of that year. The intervening 54 years have been kind to the ranch. There was a time when scholars along the Eastern seaboard and in Europe would decry the fact that a great many important art works and books were disappearing out into the general direction of the desert Southwest. No more. Huntington's taste and instincts have caused the desert to bloom in a way that no one but HEH himself had a right to figure on. His place has become an oasis that continues to attract not only fine *things*, but also bright minds to think about them. Henry and Arabella would have been pleased.

Director James Thorpe, textual scholar when he has the time, sits among French furnishings in the gallery.

Thomas Gainsborough's study of Jonathan Buttall, renowned as *Blue Boy*, is hung opposite *Pinkie*.

WASHINGTON

By Marcus Cunliffe

Symbols we made of a man named George Washington

For 250 years we have exalted, exploited and even made some fun of him, but his qualities as a leader remain untarnished

Plaster bust done by Clark Mills in 1853 was based on life cast of 1785 by Jean Antoine Houdon.

The newly commissioned General Washington arrived in New England in July 1775 to take command of the Continental forces outside Boston. Only a month later the following announcement appeared in an American gazette: "Last Sabbath, a child of Colonel Robinson of Dorchester, Massachusetts, was baptized . . . by the name of GEORGE WASHINGTON." Countless other babies were to be named after him down the years, from Washington Irving to George Washington Carver. Booker T. Washington, the distinguished black educator, adopted his surname.

Places as well as people also began to be christened in honor of the new nation's military leader. Early in 1776 the island of Manhattan acquired "Fort Washington" and "Washington Heights." Long before George Washington's death in 1799, he seemed omnipresent in the United States. After he died the process continued. In 1800 "Federal City" became formally known as Washington, D.C. By 1932, the bicentennial of George Washington's birth, his name had been conferred upon one American state, 32 counties, nearly 400 cities and townships, ten lakes, seven mountains, and a host of schools and colleges, streets and highways, parks and monuments.

By then, there can have been very few people in the United States who did not know what George Washington looked like—at least according to the portraits of the man in later life, silver-haired and solemn, done by Gilbert Stuart. As part of the celebrations, efforts were made to put a copy of the most famous Stuart portrait in every schoolroom in the land.

Two American symbols come together in a poster promoting juvenile activities on bicentennial in 1932.

[To celebrate the 250th anniversary of Washington's birth, the Smithsonian's National Museum of American History has organized a giant exhibition, *G. Washington: A Figure Upon the Stage*, opening this month.]

In part, as everyone knows, the image of Washington as one who "never, never told a lie" originated with Mason Locke Weems, the author of a widely sold juvenile biography. "Parson" Weems' generations of readers included, for example, the youthful Abraham Lincoln. Weems' *Life of George Washington; With Curious Anecdotes, Equally Honourable To Himself and Exemplary to His Young Countrymen* took on that title by the sixth edition (1808), gradually growing longer and incorporating more and more supposed anecdotes of the boyhood of Washington. Weems is the biographer who first told (probably invented) the story of how the six-year-old George damaged one of his father's favorite trees:

George, said his father, *do you know who killed that*

"George Washington Greatest American Cut Plug" could be smoked or chewed, it says on the box.

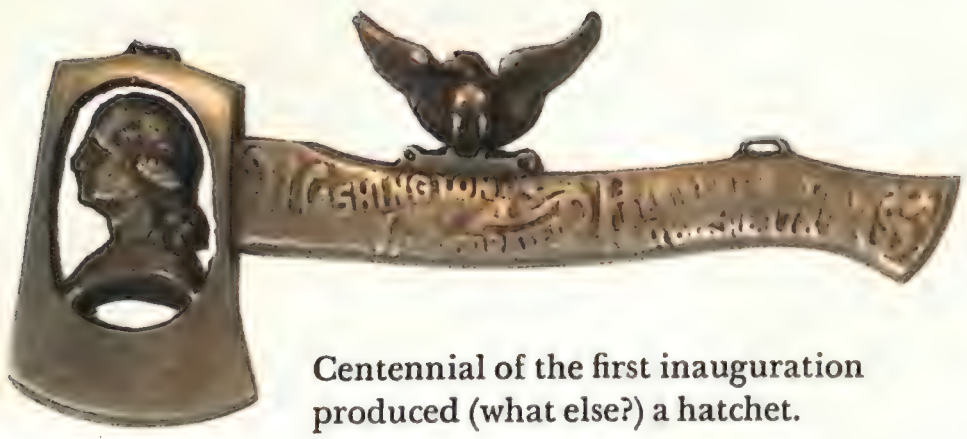
beautiful little cherry-tree yonder in the garden? This was a *tough question*; and George staggered under it for a moment; but . . . with the sweet face of youth brightened with the inexpressible charm of all-conquering truth, he bravely cried out, *"I can't tell a lie, Pa; you know I can't tell a lie. I did cut it with my hatchet." "Run to my arms, you dearest boy,"* cried his father in transports, *"run to my arms; glad am I, George, that you killed my tree; for you have paid me for it a thousand fold. Such an act of heroism in my son is worth more than a thousand trees, though blossomed with silver, and their fruits of purest gold."*

It was Weems who launched other stories, such as young Washington's ability to throw a stone across the Rappahannock River, or the religious piety that led the mature man to kneel in solitary prayer among the trees at Valley Forge. But Weems was by no means alone in producing edifying anecdotes. Other popular biographers had the youthful Washington hurling stones over Virginia's Natural Bridge, or into the Hudson from the top of the New Jersey Palisades. It was not Weems but George Washington Parke Custis (Martha's grandson) who first published the story of how the adolescent George broke a fiery sorrel colt of his mother's, only to have to confess to her that the animal had died. Whereupon his mother supposedly answered: "While I regret the loss of my [colt], *I rejoice in my son, who always speaks the truth.*"

Weems made a glorious piece of fustian out of the death of Washington and the hero's subsequent arrival in heaven, where "myriads of mighty angels hastened forth, with golden harps," and Benjamin Franklin was

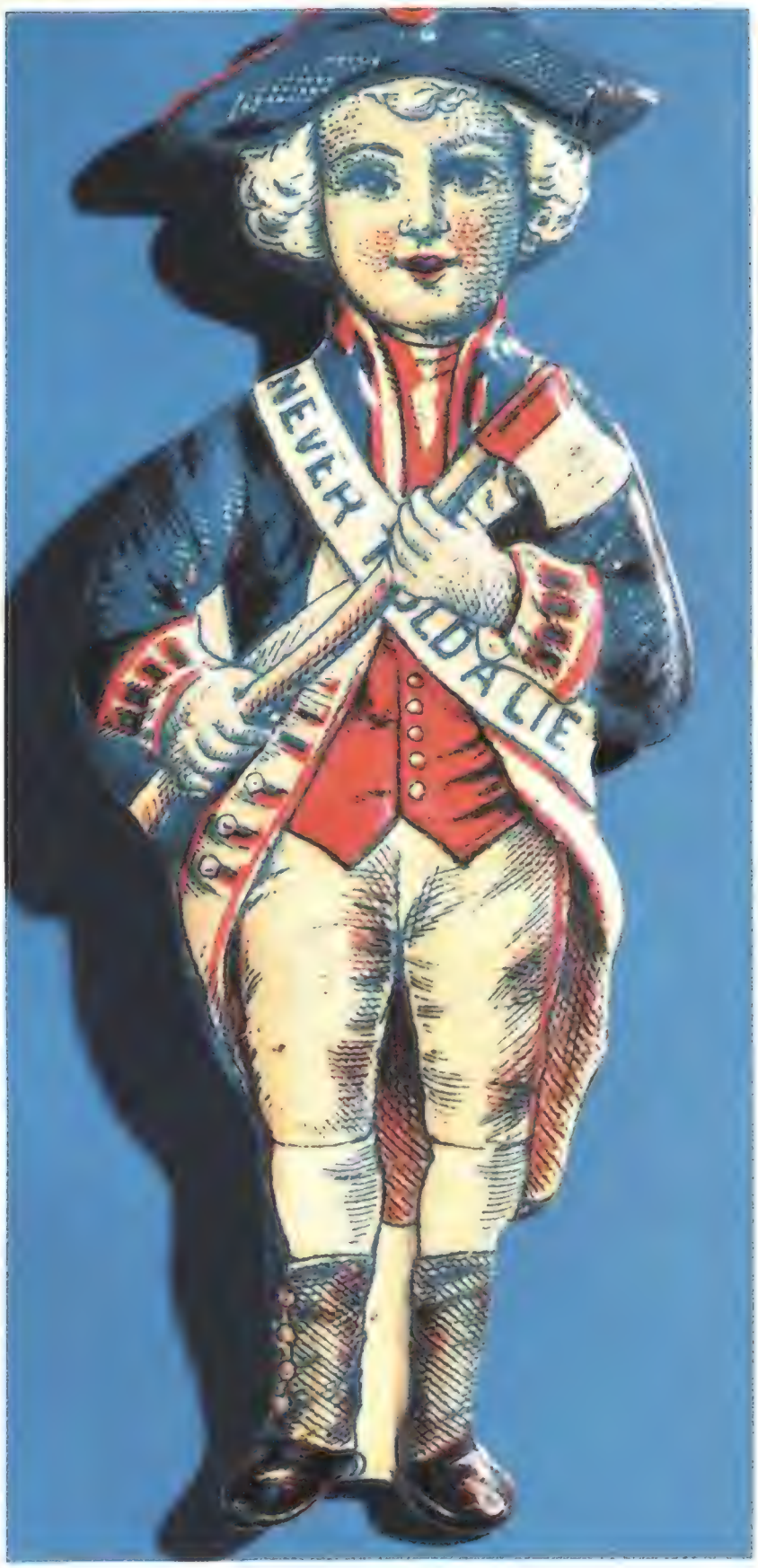
British historian Marcus Cunliffe, author of George Washington: Man and Monument, *is a professor at (appropriately) George Washington University.*

Though no teetotaler, General Washington adorns this 19th-century "Temperance House" sign.



Centennial of the first inauguration produced (what else?) a hatchet.

"Never Told a Lie" says this pin in shape of a Revolutionary soldier.



ready with sundry other virtuous patriots to provide a welcoming committee. However, the apotheosis of Washington (his exaltation in heaven) was a common enough theme in the memorial addresses delivered during the weeks and months of mourning in every American community.

In the next decades commemorative oratory welled up again on each July 4, and still more on Washington's birthday, February 22, which was a national holiday of almost equal importance. Special occasions such as the dedication of the Bunker Hill monument in Boston or of the monument to George Washington in the nation's capital were entrusted to orators of the stature of Daniel Webster or Edward Everett. The speaker's task was, almost ritualistically, to recall to the listening crowd the various tests and triumphs of the *Pater Patriae.*

Stock items exemplified Washington's virtues

For instance, Washington was industrious, frugal and systematic—ideal businesslike qualities to inculcate in young Americans. In proof of his orderliness, facsimiles of his expense accounts, as commander in chief and as President, were published by the thousand. They helped also to emphasize Washington's patriotic insistence on serving his country without a salary. (Almost no one in the 19th century ventured to remark that Washington had not done badly out of the arrangement. His commander in chief's pay would have been $500 a month. He received in lieu a reimbursement for expenses amounting to considerably more than that amount.) Again, Washington's religious piety came to be a standard theme in commemorative sermons. He had in truth been an Episcopalian, with tolerantly broad principles much like those of Franklin or Jefferson. There were several other stock items. Much was made of Washington's mother, Mary; of the supposedly beneficial effects of a mother's loving nurture.

There were several other special images of George Washington. The Federalist party, of which he had been de facto head in the 1790s, tried to win votes after his death by establishing Washington Benevolent Societies in various states. Those who signed up as members received a booklet of extracts from sacred texts such as the Farewell Address, and pledged fidelity to the late President's principles. During the 1840s, an active new temperance movement also took shelter under his name. The "Washingtonians" campaigned for total abstinence (ignoring George Washington's own moderate consumption of wine).

In the next decade, the American or Know-Nothing party, a political drive with strongly antiforeign prejudices, attempted, like the Benevolent Societies and the

Currier & Ives waxed mawkish with 1857 print, *Washington's Dream*, his vision of America.

Washingtonians, to make capital out of his great name. Know-Nothing pamphlets reprinted the Farewell Address. Above all they laid claim to the slogan "Put none but Americans on guard tonight," tracing it back to an order General Washington was said to have issued at a dark hour in the fortunes of his army.

In a less bigoted spirit, Edward Everett and other orators of the 1850s stressed the notion that, though a Southerner, George Washington was first and foremost an American—the very symbol of Union. True, the proud Virginian had been a slaveholder; yet, after all, he had left provision in his will for the emancipation of every slave he owned. Alarm at the impending crisis of the Union stimulated Everett to repeat his celebrated lecture on George Washington to scores of different audiences, turning over the profits to the Mount Vernon Ladies' Association, which was campaigning to save Mount Vernon from collapse.

On the eve of Secession, collapse also threatened what most of us would today regard as the supreme image of George Washington, his Monument in Washington, D.C. In 1860 it was an unfinished stump, a mere 156 feet high—a forlorn object, surmounted by a derrick, standing in the swampy Mall. Construction, not resumed until the 1870s, was completed in 1885. At the dedication in that year, orators once more reverted to the idea that the soaring obelisk was the ultimate symbol of George Washington.

In almost all the huge outpouring of panegyric, we can see the effort to reconcile two seemingly opposed axioms: that Washington was a unique figure, and that he was representatively American. The first proposition grew from comparing him with renowned personages of ancient times (Epaminondas, Cincinnatus) or of modern recent history (Peter the Great of Russia, Frederick the Great of Prussia, the Duke of Marlborough, Napoleon Bonaparte). Except for Cincinnatus, a half-legendary rather than a real hero, the invariable conclusion was that, whatever the military or other prowess of these mighty figures, only Washington had been truly virtuous. The rest had revealed fatal flaws: arrogance, greed, cruelty, sexual immorality. Therefore Washington *was* unique.

A harmony of goodnesses attainable by all

If so, how could he be regarded as an American product, capable of being imitated by the nation's youth? A partial explanation was that America was an exceptionally virtuous society, not to be compared with the corrupt systems of the Old World. Thus, foreigners might be unfaithful to their wives: Americans as a whole, it was asserted, followed George Washington in respecting the sanctity of the home. A second notion was that Washington represented the triumph of "character," a perfect balance of unspectacular though essential attitudes. Others might possess greater genius, military or otherwise. It was conceded, indeed, that Washington lacked renown as an orator; he did not throw off epigrams, write verse, speak in a tongue other than English. He was no philosopher or scientist. His greatness consisted of a unique harmony of different goodnesses, each being attainable by ordinary, virtuous human beings. Such a laminate—incomparable greatness built up from layers of commonsense decency—made Washington an inspiring and a flattering hero for citizens of the American republic. His bravery, his magnanimity, his curious serenity could all be seen as instances of an integrated personality, a mind at rest with itself instead of being tormented with visions on the Napoleonic scale.

There were, however, drawbacks even to an imagery so republicanly plain; and these increased every decade with the spread of brash egalitarianism in the United States. One danger was that Washington would simply cease to interest people because he lacked novelty or drama. "Every hero," said Ralph Waldo Emerson, "becomes a bore at last." The average American, Emerson felt, was apt to react to the pleth-

ora of praise with: "Damn George Washington!" Or Americans could begin to ridicule treatments of Washington that struck them as overblown and undemocratic. This did not happen with the idealized heroism of Emanuel Leutze's *Washington Crossing the Delaware* (first displayed in the United States in 1851)—possibly because, despite the indomitable calm of Washington's own pose, the painting deals with a palpably dangerous and audacious enterprise, not some static, grandiose composition.

On the other hand, Horatio Greenough's marble statue of Washington, modeled on a classical rendering of Zeus, met mainly with laughter and abuse when, having been commissioned by Congress in 1832, it was put on display in Washington some years later. The statue, according to the acid commentary of Philip Hone of New York, "looks like a great Herculean warrior—like *Venus of the bath* . . . undressed with a huge napkin lying in his lap and covering his lower extremities, and he, preparing to perform his ablutions, is in the act of consigning his sword to the care of the attendant." Edward Everett was among those prepared to admire Greenough's ambitious work. But popular taste remained hostile. An intelligent lady remarked in 1876 that the ordinary American could not "reconcile a Jupiter in sandals" with "Washington in knee-breeches and buckled shoes."

By the 1870s a "humanizing" effort had set in: an effort, that is, to analyze George Washington accurately and unsentimentally, in keeping with the canons of professional scholarship. Books and articles on the "real" or the "true" George Washington began to appear. By then, too, it was possible to be mildly critical of him and Martha and scathingly severe on "Parson" Weems, described in Henry Cabot Lodge's *George Washington* (1889) as "a man destitute of historical sense, training, or morals." Cartoonists and humorists began to make fun of the more priggish elements in the conventional treatment of Washington. His name and face were more and more casually borrowed to advertise commercial products: an exploitation to which, of course, even living American celebrities were equally subject.

Some historians argue that after the Civil War Washington was replaced as principal American hero by Abraham Lincoln. "Honest Abe," it is said, was more likably ordinary: more appealing to black Americans as the Great Emancipator; and more pathetic as

Country-music station in Washington, D.C., area puts cowboy hat on first President's august head.

Smithsonian "Under Construction" poster for current exhibit tops Greenough's statue with a hard hat.

Amon Carter Museum, Fort Worth

Grant Wood's 1939 painting, *Parson Weems' Fable*, has Weems drawing curtain to present episode.

the nation's "martyr." In 1865 the poet James Russell Lowell, in his Harvard Commemoration Ode, identified Lincoln as the "first American"—a product of the democratic West.

Since then, it may well be that Lincoln holds prime place in American affections, though Washington retains priority of time and perhaps of a hallowed timeless dignity. It is also noticeable that Lincoln himself has become stylized in certain set images ("Rail-Splitter" and so on)—which means that he too could eventually become "a great bore" for irreverent Americans. Perhaps, though, the few who pass into the permanent pantheon of national folklore are by definition figures of stone or crystal, glazed with unreality.

Once that happens, a hero of the stature of a Washington does not, in fact, cease to interest people. All sorts of allusions and associations come into play, whether or not we are always aware of the process. Even facetious or would-be debunking references to him have vitality only in relation to the old adulatory anecdotes. Grant Wood's view of the cherry tree incident is delightfully humorous (above). Yet for full effect it depends on a high degree of sophistication on the part of the audience.

Properly to appreciate the painting, we need to know the role of Mason Weems in introducing the "little hatchet" story, and thereby to understand why Weems appears in Wood's picture, pulling aside a theatrical curtain to disclose a kind of tableau. The characteristic, idyllic roundness of Grant Wood's landscape style in turn gains an extra, dreamlike charm in being applied to Weems' ingratiating fable. Wood's Washington is an adult in miniature; and this too seems amusingly apt without being cheap.

There are some other, mostly ironic examples of the usefulness of Washington images for modern America. Edward Albee's play *Who's Afraid of Virginia Woolf* (1962) is a caustic depiction of marriage held together by hate more than by love. The happy (or rather, unhappy) couple in the play are named George and Martha. Albee may not gain a great deal by doing so. Yet the mere naming sets up vibrations.

A subtler instance of a possible echo effect may be suggested. In Leutze's *Washington Crossing the Delaware*, American soldiers strain to hold aloft a half-furled national flag. The angle of the flagpole and the grouping of the soldiers anticipate the famous photograph of U.S. Marines raising the flag at the summit of Iwo Jima—a moment of frozen drama reenacted sculpturally in the Marine memorial in Arlington. The similarity is almost certainly accidental. Nevertheless, part of our response to the World War II scene may derive from Leutze.

A richly miscellaneous folklore has grown up around George Washington in the course of two centuries and more. Indeed this associative imagery probably works more profoundly upon the American psyche, in comic no less than in serious forms, than the well-intentioned efforts of generations of scholars. Scholars strive, as they must, to keep the record verifiably straight. Folklore, however, is wondrously indifferent to footnotes; and the immensely various folklore of Washingtoniana is no exception to this rule.

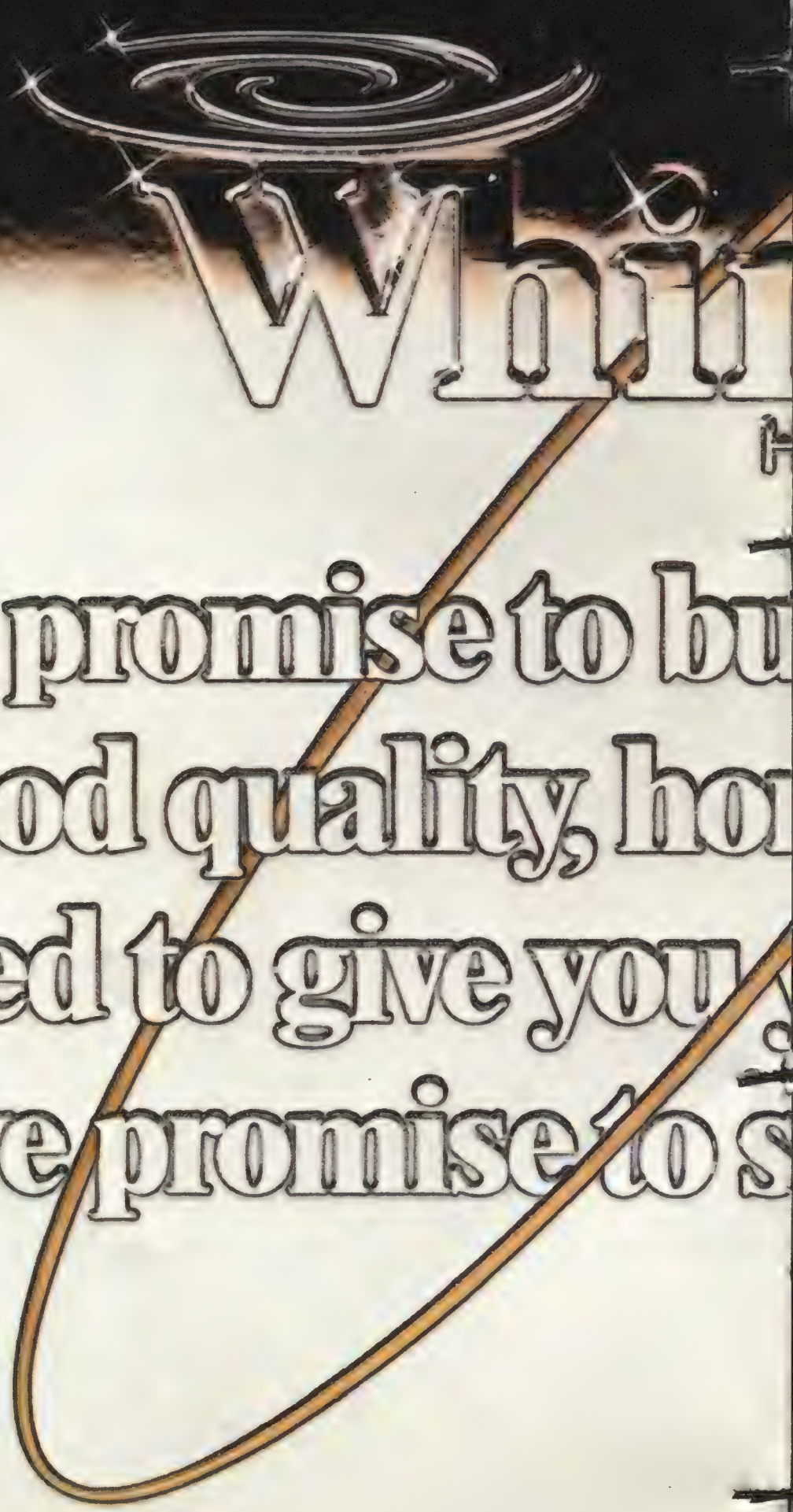
Even so, academic and popular responses to George Washington reinforce rather than quarrel with one another. Modern biographers have no qualms in revealing minor errors or defects in his record: for example, that he was almost aggressively ambitious as a young man, and occasionally fussy in old age. But these are trivial weaknesses. No major ones have been disclosed. George Washington has stood the test of time to an astonishing degree. It turns out that the various flattering images of the man are all true, broadly speaking. He *was* a genuine patriot, a fine soldier, a dignified executive. Oddly enough, the Weemsian caricature, however crude in execution, proves to have been a pretty fair likeness.

Some facets of the legend may now seem a little bombastic, such as the once-common assertion that Washington was "The American Moses." Again, though, he *did* lead his people out of a kind of bondage, toward a kind of Promised Land.

The Apotheosis of Washington—a final deification—was done on glass by Chinese for American devotees.

The China Trade Museum, Milton, Massachusetts

We still believ



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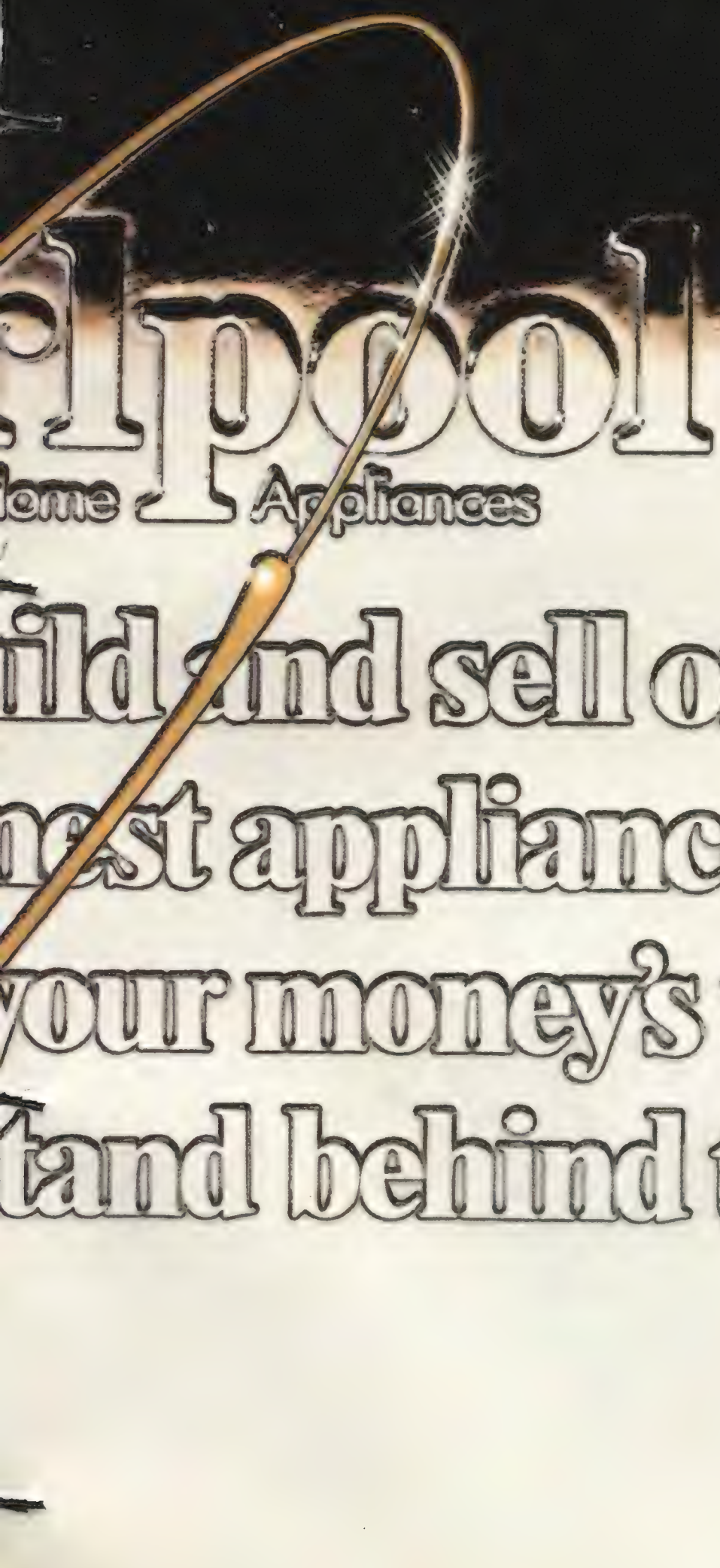

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The knowledge business

By Bil Gilbert

Adaptable coatis flourish from mountain to jungle

This little-known native of the Americas and relative of the raccoon has a matriarchal society that keeps the males in their place

The coati (*Nasua narica*) is both popularly and scientifically among the least known and observed of our native mammals. There are a variety of reasons for this. Though common in large areas of Central and South America, coatis are found in this country only in small restricted areas of southern Texas, New Mexico and Arizona. Most frequently they have been reported in a series of isolated mountain ranges, the Chiricahuas, Huachucas, Santa Ritas and Baboquivaris, that, somewhat like islands, jut up out of the Sonora Desert in southern Arizona. These mountains are precipitous, cut with deep canyons, covered with thick brush —making casual coati observations chancy and serious studies difficult, time-consuming and expensive.

Furthermore, the coati is not the sort of animal that inspires official research. They are not hunted nor are they valuable furbearers, and thus do not much concern state game agencies which provide most of the funds and personnel for wildlife investigations. They are not—as coyotes or prairie dogs are—usually regarded as varmints by farmers or ranchers and therefore do not attract the attention of public exterminating (wildlife control) agencies. Nevertheless, there are things about the coati that make them animals of considerable intellectual interest and emotional appeal.

Foraging atop a paloverde, coati seeks tasty buds. Adept climbers, they also take to trees when in peril.

Several years ago I became curious about the activities of this species in the United States—sufficiently so that I moved with my family to southern Arizona with the specific purpose of meeting feral coatis. We stayed a year, during which I, along with three students, camped in the Huachuca Mountains and more by luck than astute planning became fairly intimately acquainted with a number of coatis. When this first study and a book about it were completed, we left the area but returned frequently to see how things were going with the coatis. At present I am back in the Huachucas and plan to remain for a few more years, living in a ranch house 6,000 feet up in one of the forested canyons, some seven miles from the closest human residence. Coatis are an important reason for being in this place because it is a good one in which to watch, think about and admire these animals who greatly engage my mind and heart.

Physically a coati somewhat resembles an elongated raccoon. (The coati, raccoon, ring-tailed cat, kinkajou and olongo are members of a New World family of medium-size carnivores called the Procyonidae.) Both have facial masks, but the muzzle of the coati is longer and more pointed, vaguely suggestive of an anteater's. Both have ringed tails, but that of the coati is proportionately much longer, being about two feet, or somewhat longer than the body. The tail is slender, wand-like, and seems as if it should be prehensile—adapted for gripping like that of a spider monkey. It is not, but along the border many think it is. On the northern side of the boundary, in fact, the animals are sometimes called Mexican monkeys. More commonly they are known as chulos.

A varied diet, from mice to eggs

Typically, males are in the 12-17 pound range and females three or four pounds lighter. Like raccoons, coatis are omnivorous and will feed on a great variety of vegetable and animal matter. As predators they will take small mammals, mice, ground squirrels and eggs when they can. However, in the southern Arizona mountains they seem to prey most often on the larger invertebrates – grasshoppers, beetles, spiders – and upon reptiles, generally lizards but occasionally snakes. They hunt for these edibles by rooting in the earth, turning over rocks and logs. Powerful shoulders, strong, blunt claws, manipulative forefeet and the long probelike nose are characteristics well adapted to these activities.

Chulos have long, flattened, canine teeth which are their principal and formidable defensive weapons. It is imprudent—as several lasting scars on my arms testify—to antagonize even one of the animals, and as a practical matter (about which more shortly) they are

Long, curved claws are bad news for the insect delicacies this animal seeks in a rotten log.

usually met in groups. Few other animals—including, by report, mountain lions—are able or willing to confront a band of aroused chulos. Lion hunters claim hunting dogs have been mauled or killed by them.

It has long seemed to me that social habits and skills —the word seems appropriate in this case—are the most remarkable characteristics of this species. Now that wolves are all but gone, coatis are the most consistently and conspicuously communal of all our carnivorous mammals. Among them there has evolved an intricate system of relationships that influence the hunting, feeding and territorial behavior of individual animals, define their responsibilities in protecting and instructing the young and establish prerogatives regarding play, grooming and other forms of presumably agreeable association. These social arrangements determine how adults of the opposite sex will meet and treat with each other.

For much of the year sexual relationships appear to be essentially hostile. But the social functions and position of a coati within the group change from season to season and the relationships are repeated in annual cycles. Therefore, as with all circular phenomena, there are no true beginnings or endings. However, in my case I first became acquainted with coatis in the fall of the year, which makes a convenient starting point for description, since in this season the community is particularly stable and the roles of individual animals rather firmly fixed. The size of coati groups—which we chose to call tribes—varies from five or six animals to 20 or so. (There are reports of congregations of more than a hundred animals—we saw as many as 50. Most probably several tribes meet to take advantage of temporary concentrations of food.) In the tribe which I came to know most intimately, there were 23 animals: 12 juveniles—3 males and 9 females—and 11 adults, 5 females and 6 males.

In the fall all of the adult females and juveniles formed a communal unit. Sometimes during the day these 17 animals would divide into two groups, which we called foraging bands, but would generally reunite by evening. Together they ranged about four square miles—from 4,500 to 7,000 feet of elevation—in a large craggy canyon thickly set with oak, Mexican piñon, manzanita, agave and associated growth. At this time none of the adult males associated with the female-juvenile group. When occasionally one would attempt to do so, a tribal matriarch would immediately and sometimes savagely force him to retreat. The males also avoided each other and generally remained in smaller subterritories within the overall tribal range. These arrangements prevailed from mid-fall until late

Bil Gilbert's latest contribution to SMITHSONIAN *was on the Aldo Leopold Reserve in the October 1980 issue.*

Four coatis huddle together to feast on some food set out for tapirs in Panama laboratory clearing.

winter—at least prevailed among this particular tribe.

The latter qualification is an important one. As a species, coatis occupy an immense area, from the cold, dry highlands of Arizona to the tropics. They can do so because they have become mammalian generalists, able to adapt to disparate environmental conditions. As a specific example: in 1958-60 John Kaufmann, now a distinguished zoologist at the University of Florida, conducted a study of coatis in Panama. Subsequently, because of our mutual interest in the species, we became acquainted and compared notes and observations. Many behavioral patterns were much the same among the Arizona and Panama coatis, but there were also notable differences. An obvious one had to do with their denning and nesting habits. In Panama, for example, the animals constructed rough platforms of vines, leaves and brush in trees. In Arizona, so far as I know, there has been only one case of such behavior and that an odd one. A young male, kept as a pet on the Papago Indian reservation, ripped apart a mop and used the parts as elements in such a platform in a paloverde tree. Otherwise all observers have found coatis denning and nesting in small caves in cliff walls. The obvious reason for this difference is that Arizona does not have suitable trees—nor Panama caves—and the coatis have adjusted accordingly.

There are speculative explanations as to why the adult males, among the southern Arizona coatis, were

so firmly ostracized from the female/juvenile community during the fall and winter. Food is scarce then and the segregation may serve to protect young animals from competition with the adult males, which have been observed to have predatory inclinations in regard to the juveniles. For whatever reasons, the ferocity with which the females assaulted males who ventured too close suggested that repelling them was urgent.

A principal matriarch of the tribe was a small, scarred, one-eyed—probably elderly—female whom we called The Witch because of her apparent influence with the other animals and seemingly clairvoyant awareness of our activities and intentions. (Her powers were in fact probably olfactory. All coatis have keen noses, and circumstantial evidence indicated she was something of a genius in this regard.) The most aggressive of the tribal males was a 17-pound animal, nicknamed The Supervisor. He showed persistent interest in the communal group and on at least one occasion was able to edge up within ten feet of two juveniles who were grubbing under a fallen log. The young animals displayed no alarm and in fact showed little interest in the large male, and there was nothing threatening about his reaction to them. However, The Witch suddenly charged out of the brush, slashed at the male and knocked him off his feet. He recovered and fled at a full bouncing gallop. The Witch pursued him briefly and then stood facing the direction in which he had gone, lashing her tail and emitting snuffling growls—both signs of an enraged chulo. To me it seemed that this was only incidentally an individual confrontation, not a display of exceptional valor on the part of the eight-pound female or cowardice of the big male. The Witch, representing the community, had routed The Supervisor.

When traveling, the communal animals proceeded in a fairly disciplined way—an adult female ahead and another trailing in the rear of the group. The remaining females and juveniles moved along between these two in no particular formation. (When we joined this tribe it was impossible to determine which juveniles were offspring of which females. Juveniles were as responsible to one female as another and we observed no special patterns of association between them.) Generally the young remained within the group, but when one strayed, a female would commence chattering "come here" calls and if these were not obeyed go after and herd the straggler back to the group.

As might be expected with such social animals, coatis are very communicative. They make a variety of snuffling, growling, chattering, hissing, barking and peculiar chop-chop sounds which are punctuated with tail movements and gesturing postures. By these means they indicate alarm, anger, pleasure, give warnings and provide information about where they are and what they are doing. The Witch, who invariably was the rear animal when the tribe was traveling, was the most prominent communicator. It was impossible for us—and we presumed anything else—to approach the group without this animal knowing it and informing the others. Initially her response was to challenge us—assuming a head-down tail-up position—and make a series of alarm and warning sounds in response to which the other animals might freeze, dash up into trees or flee through the brush. However, after a few months of being in almost daily contact she seemed to decide that we were harmless though vaguely annoying. She continued to make it clear that she was well aware of our presence but her responses were less urgent and so were those of the group.

The Witch on guard

The Witch was not a dominant animal as this term is often used—that is, one who exercised direct authority through coercion or other means. Nor did she seem to have any special privileges or prerogatives within the tribe. (Unlike other procyonids, the social interaction between adult female coatis appears to be the principal bond holding a community together.) In practical terms her role was individually disadvantageous—as is often the case with what we casually call leaders. Her guard and sentry duties placed her in risky positions where she would be the first to face attackers. Also, she usually came to good feeding places after the other animals had been there and so spent proportionately less time in them. She was the principal control animal, to which the group was, for whatever reasons, especially attentive and responsive.

Customarily the tribe progressed slowly through the brush until one of the females came upon a promising spot and began to forage. Other animals would do

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1860 *TODAY*

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No Ferdinand, but a defiant coati responding to threat, snorts and prepares to hold its ground.

likewise and the group fanned out like a line of skirmishers, poking about in the rocks and litter. By simultaneously foraging in a small area they serve in effect as beaters for each other. A lizard or mouse flushed by but escaping one chulo was very apt to flee into the paws or jaws of another.

Several times a day the group would halt to rest and for what can most descriptively be called recreation. Within the canyon there were several broad, secure ledges which were regularly used for these purposes. On them the adult females would sprawl out in the sun to nap or groom each other. The juveniles would play, chase and wrestle together, squabbling over small found objects. Like raccoons, coatis can become engrossed in fondling a pebble, bit of wood or bone. Occasionally in these periods when tribal discipline was relaxed, a cub or several of them would pounce on a female, worry and tease her. When this sort of roughhousing went too far, the female would remind a cub of its manners with a swat or nip.

This sort of daily routine continued until March, when it began to change, presumably in response to the hormonal currents freshening in the adults. Males began courting, but it seemed not so much individual females as the group itself. Increasingly males would attempt to associate with the communal animals and while they were not welcomed, they were not so consistently or ferociously repulsed by the females. For a few minutes—or later for some hours—a male might travel or forage on the fringes of the group. When doing so they were unobtrusive and their manner essentially diffident, as if attempting to establish themselves as respectable, law-abiding tribal citizens. These tours would terminate when a female in a rather absent-minded, pro forma way would turn on the male and without much passion drive him away.

Through the fall and winter the males had circled the group somewhat like satellites, attracted to it for some reason but kept at a considerable distance because of the animosity of the females. As the spring progressed interest increased and hostility decreased. The males began orbiting more closely about the group. In consequence there were frequent encounters between the males, and these were anything but pacific. When they met, two males would assume defiant positions and commence running through an elaborate repertoire of hostile growls, snarls and gestures. More often than not, this threatening behavior

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was enough to make one of the animals retreat, but sometimes physical combat took place, the animals tumbling and slashing. Two of the tribal males received serious wounds, and we heard reports from elsewhere of males being killed in these springtime duels.

Among the males a hierarchal system of dominance was established, the large, vigorous Supervisor emerging as the ranking animal, though so far as we observed he never had to fight, his presence and threat displays apparently being sufficient to maintain his status. Toward the end of March he had so cowed the other males and ingratiated himself with the matriarchs that he was able to stay with the group more or less at his pleasure. Subsequently copulation occurred. Considering the lengthy and complex courtship period, mating itself was perfunctory. Before and after copulation, the partners showed no particular preference for each other's company.

The Supervisor gave the impression that he found being accepted by the females less stimulating than the challenge of becoming accepted. During the height of the breeding season he would wander away from the group voluntarily, so far as we could determine. When he disappeared one of the lesser males would join the group and would be treated, socially and sexually, in the same seemingly dispassionate way.

As later events indicated, all of the mature females were impregnated by the tenth of April. Presumedly in consequence there followed a period of social upheaval and, in comparison with the previous tribal arrangements, chaos. The gravid females began to wander off and antagonistically discouraged the young from following. When they returned they behaved irritably toward the juveniles whose protection and instruction had been of such importance during the preceding ten months.

Spurned by the females, the juveniles increasingly attempted to associate with the males, one or two of whom were usually with the group. (With the passing of the sexual season, hostility between adults declined. When they were present, adult females reacted to the males more or less as they did to the juveniles—peevishly.) The males, however, accepted the presence of the younger animals but seemed uninterested in whether or not they remained with or followed them. Left for the first time to their own devices, the juveniles drifted apart either as individuals or in small accidental groups.

During May two of the young animals disappeared and there was strong circumstantial evidence that they were taken by either a red-tailed hawk or golden eagle. Both species have been reported to prey on coatis and

Coatis swim only when absolutely necessary. Here, they have escaped an anaconda on the opposite bank.

a pair of each of these raptors was then hunting in the canyon. Logically it seemed this might be a particularly dangerous time for the young animals, who during the rest of the year are relatively impervious to predation because of the tribal security arrangements.

By June the five adult females were seldom found with the males and juveniles, but did occasionally associate with each other. Early one evening I witnessed such a meeting. Its memory has remained vivid.

There is a small seep spring in a hollow at the base of a precipitous cliff, about 6,000 feet up in the canyon. This was much used by the coatis and therefore we often sat on a narrow ledge above it to observe them. On this evening The Witch and another pregnant female, both of whom were then usually solitary, came toward the seep spring from opposite directions. They met at the rim of the hollow and made some chirping, trilling calls and then touched and gently rubbed their long muzzles. The two heavy, gravid animals waddled down to the spring, drank and awkwardly climbed out of the hollow, disappearing together. I have never formed any opinions about the behavioral motivation or significance of this incident, but it was and has remained a moment which charmed and moved me.

Thereafter the females became, from our standpoint, exceptionally secretive, so much so that by mid-June we rarely were able to find them. The gestation period being about 77 days, our assumption was that during the last two weeks of the month they bore young in caves which we were unable to find. During early August we first observed the tribal matriarchs abroad and foraging, with very active cubs of that year. (Collectively four of the females brought eight new cubs out of the caves. The fifth female either did not give birth, though she had appeared to be pregnant, or her cubs did not survive.) About the first of September the adult females, the cubs and five of the juveniles (then subadults who had survived after their four-month period of social weaning) regrouped and again the adult males were ostracized. At this point, when it seemed that the tribal organization had been reestablished, we regretfully ended our day-by-day association with these animals.

All creatures, or at least all we sexual ones, are engaged in a figurative way in ongoing social dances, the apparent purpose and function of which is the survival of our offspring. That of the coatis is no more effective than that of others but it has seemed to me that the intricate, continually synchronized movements that involve all members of a coati community make their existential dance a peculiarly thought-provoking and beautiful one.

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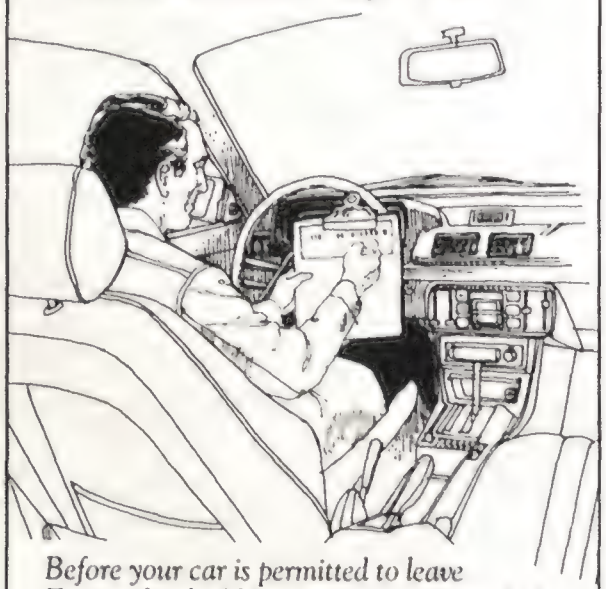

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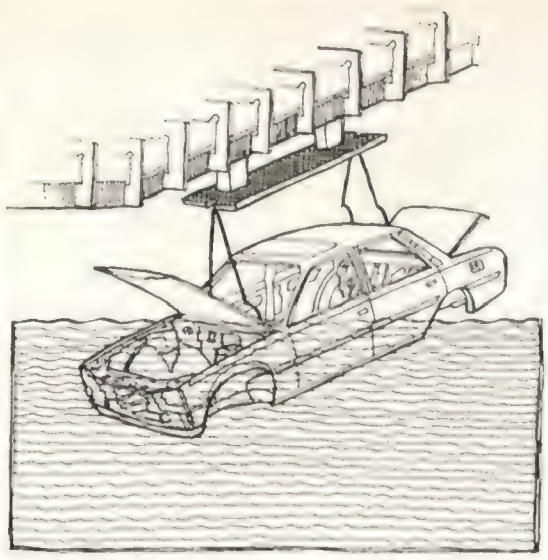

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By Jill Jonnes

The tale of tea, a fragrant brew steeped in history

The beverage was once a subject of virulent controversy, but it has been helping people to get through the day for some 4,000 years

Samuel H. G. Twining before doorway of store founded by an ancestor eight generations ago.

In 1706, Thomas Twining opened his coffeehouse in England on the Strand, near the site of the small church of St. Clement Danes and a stone's throw from Temple Bar. Twining, a weaver turned merchant, served not only the usual coffees and cocoas, but also a relatively unusual hot brew from China—tea.

Nine generations later, the Twinings firm still sells China tea out of that same Strand shop, its entryway crowned by figures of two seated Chinese and a symbolic lion (right). Twinings, teamen to the royal family now as earlier, remains devoted to trading quality teas, though its fragrant Earl Greys or Lapsang Souchongs are more likely to be sold in tea bags to supermarket patrons than dispensed in heavy wooden chests to English country houses. With Twinings' 275th anniversary just past, this old English ditty is as apt as ever:

It seems in some cases kind nature
hath planned,
That names with their calling agree,
For Twining the Teaman that lives in
the Strand
Would be "Wining" deprived of his T.

When tea was first served in such London coffeehouses as Thomas Twining's, it was an expensive, somewhat mysterious drink obtainable only from China and drunk from small, shallow bowls. Its most fervent promoters, who touted its exotic origins and alleged medicinal qualities, probably never dreamed that this simple, fragrant liquid made from leaves and boiling water would become the world's most popular drink.

The House of Twining claims some credit for tea's meteoric rise, for it was Thomas who served tea to women in a public place and then Richard Twining, in 1784, who helped persuade Prime Minister William Pitt to so lighten the English tea tax that the beverage became more widely available. Before long it was no longer a luxury but a necessity. "Thank God for tea," wrote the Reverend Sydney Smith, a 19th-century essayist. "What would the world do without tea? I am glad I was not born before tea."

While there is no doubt that tea was first brewed and appreciated in China, its early history is murky. There is a reliable reference in a dictionary dated A.D. 350, but the discovery of tea (*ch'a* in Chinese) is traditionally attributed to the legendary emperor Shen

In Sri Lanka, where a blight ruined coffee plantations a century ago, women now pick tea.

The prim but realistic *Afternoon Tea Party* was painted by Mary Cassatt about 1891.

Nung, who lived about 2737 B.C. The story goes that he was boiling water when leaves from a nearby bush drifted into the pot. The aroma and taste entranced the emperor. Says a reference from his medical book: "It quenches thirst. It lessens the desire for sleep. It gladdens and cheers the heart." Japanese mythology credits the Buddhist saint, Bodhidharma, with the creation of the divine bush in China. For it was he who, "overcome with sleep during his meditations, cut off his eyelids and threw them on the ground, where they took root and grew up as tea plants."

By A.D. 780 tea had become so popular in China that tea merchants commissioned a book, the *Ch'a Ching* or Tea Classic, which told the history of tea and extolled the multitudinous virtues of their product. One Han emperor was quoted: "The use of tea grows upon me surprisingly: I know not how it is, but my fancy is awakened and my spirits exhilarated as if with wine."

Yet despite tea's widespread use in the Orient, it remained unknown in the West until the 16th century. Perhaps the first mention of it in European literature is in *Voyages and Travels,* compiled by the Venetian author Giambattista Ramusio and published in 1559. There tea is described as a very hot drink of medicinal qualities, "commonly used and much esteemed over all those countries. . . . Taken on an empty stomach [it] removes fever, headache, stomach ache, pain in the side or in the joints."

Over the ensuing decades, travelers and traders returning from the Orient remarked on the popularity of the strange brew and, even more astonishing, the high value attached to the teapots, small cups and cannisters connected with tea making and drinking.

The author, who wrote about church restoration in the January 1981 issue, looked into tea on a visit to England. She is writing a book on the South Bronx.

Kitagawa Utamaro, 18th-century Japanese artist, created this woodblock, *The Teahouse Maid.*

In grandmother's day, dressed-up ladies take tea on the pillared porch of a New England home.

The brew has become worldwide; this sidewalk samovar provides a tea break in the Soviet Union.

Tea, although today viewed with equanimity, was the subject of virulent controversy upon its introduction to Europe. One German doctor warned: "It hastens the death of those that drink it, especially if they have passed the age of 40 years," but a Dutch physician found it almost an elixir: "Nothing is comparable to this plant. Those who use it are for that reason, alone, exempt from all maladies and reach an extreme old age." In France, the celebrated Dr. Gui Patin in 1648 called it the "impertinent novelty of the century," only to repent nine years later and accept tea as an effective treatment for gout.

It 'helpeth the Headache,' maybe

In the midst of this debate on the Continent, tea made its public debut in England. In 1667 Thomas Garway, a London coffeehouse keeper, advertised tea as a medicinal wonder and sold it by the cup as well as in bulk. Garway lured the public with reports that "those very Nations famous for Antiquity, Knowledge and Wisdom, do frequently sell it among themselves for twice its weight in silver" and then went on to denote dozens of virtues, such as "It maketh the body active and lusty. . . . helpeth the Headache, giddiness and heaviness thereof [and] removeth the obstructions of the Spleen." Despite such come-ons, it took the English upper classes (certainly the only group that could possibly afford it) some time to take to tea. The new brew received a royal boost when Charles II married the Portuguese princess Catherine of Braganza, who brought along her devotion to tea and tea parties.

Some 40 years later, when Twining opened his coffee shop with tea as a specialty, it was finally gaining favor as a fashionable beverage. By 1717, Twining's success emboldened him to open the Golden Lyon, a tea parlor serving women as well as men, thereby firmly establishing tea drinking as a genteel, healthful practice suitable to home and family. As tea caught on, controversy arose again, not only about its physical and mental effects, but about its social effects on a country in which this costly drink was becoming the rage.

One women's magazine called it the "bane of housewifery," while an eminent political economist of the day, Arthur Young, saw it as an evil influence on the entire economy, as time previously devoted to work was now given over to tea breaks. London merchant Jonas Hanway in 1756 denounced tea as "pernicious to health, obstructing industry, and impoverishing the nation." Yet Dr. Samuel Johnson seemed to speak for a nation that could not get enough of this wonderful brew: he confessed to being a "hardened and shameless tea drinker, who has for many years diluted his meals with only the infusion of this fascinating plant; whose kettle has scarcely time to cool; who with tea

A portrait by William Hogarth of Thomas Twining, who started the London business 275 years ago.

The present Earl Grey, at Twinings Strand shop, drinks the tea that was named for his ancestor.

amuses the evening, with tea solaces the midnights, and with tea welcomes the morning." He had been reported to drink 16 cups at one tea party.

Long before tea captured the hearts and pocketbooks of their countrymen, the shrewd English merchants who ran the East India Company obviously saw the makings of a lively business and obtained a monopoly on the importation of Chinese tea into England, which was to last until 1833. Over the years a higher and higher tax was applied, until it was more than 100 percent. As the demand for tea grew, smugglers filled the gap with cheap tea—much of which was adulterated. By the mid 1700s, when every English home—however humble—had to have tea, smuggled tea accounted for half the nation's consumption.

Legitimate merchants were further aggravated by events in America, where the Colonists, infuriated by a new tax on tea, were making their anger known in no uncertain terms. In Boston, New York, Charleston, Philadelphia and Annapolis, Colonists were organizing a new kind of tea party—in which the offending produce was either "brewed" in the nearest harbor, burned or returned to London. Tea, until then a most popular drink, was out of favor with all right-thinking American patriots. Groaned one New York teaman: "There will be no such thing as selling it, as the people would rather buy so much poison." (Davison Newman & Co. Ltd., the firm whose tea supposedly was dumped in Boston, still sells tea in America under the good-natured name Boston Harbour tea.)

Lower tax, more tea, no smugglers

Squeezed by the smugglers and aggravated by the patriots, the tea traders banded together to seek relief. Richard Twining, third generation of the by then well-established firm and also chairman of the London tea dealers, proposed to Prime Minister William Pitt that the tea tax be dropped and any loss of revenue be compensated by the merchants in lump-sum payments. Instead, the tax was cut to about 12½ percent. The cheaper tea sent sales soaring in 12 months from six million pounds per year to 11 million pounds. The smugglers, who had stored their tea in caves and tunnels along the coast, quickly went out of business. Tea's ascendance seemed assured and in 1800 Richard Twining wrote to his traveling son, "We carry on a roaring trade. . . . Mr. Jones is now getting samples (here he comes) from chests, which reach from one end of the warehouse to the other."

The last half of the 19th century marked the most glorious and romantic era of tea, for it was then that the cultivation of tea began to spread throughout Asia and that the beautiful clipper ships raced from China to London. In the early 1800s, wild tea bushes were

reported in the jungles of Assam in northern India. Over the years, this created excitement within the trade, for most of the efforts to establish tea estates outside China using Chinese seeds had not been successful. (And those seeds had been spirited out of China, for the Chinese had always kept foreigners from entering the tea-growing areas.)

Fortunately, the Indian bushes proved amenable to cultivation and tea estates began to be planted in India, Ceylon and Indonesia in the following decades. So great was the enthusiasm and so vast the fortunes being made that "tea mania" struck in 1860 and "All sorts and conditions of men became obsessed with the frenzy, many of them throwing up lucrative posts" to plant tea gardens when they "did not know a tea plant from a cabbage."

The day of the speedy tea clipper

The rage for tea was spilling into the realm of accouterments; teapots, caddies and spoons were reaching new heights of both elegance and frivolity. The early imitations of Chinese porcelain had given way to elaborate silver services or such whimsies as teapots that looked like animals or heads of cabbage. Tea containers or caddies became more and more elaborate wooden boxes (equipped with lock and key to safeguard against pilfering), while special silver caddy spoons were being fashioned in the shape of feathers, shells, jockey hats and coal scuttles.

As both tea supplies and consumption soared, merchants sought swifter shipping and delivery. The solution was the elegant clipper ship. The clippers, topped with three masts and a cloud of small sails, were lithe, graceful and designed to cleave the waves more deeply. The first clipper, *Ann McKim,* was followed by *Rainbow,* designed by John Willis Griffiths, an American, and launched in 1845. *Rainbow*'s second run to China out of New York City was so fast that her owners were still waiting to hear if she'd made it to China when she sailed back into the New York harbor. Her performance—180 days—caused a sensation and the Golden Age of the Clipper Ships was launched.

In 1869 the Suez Canal opened and signaled the end of the clipper ships, for even those fleet vessels could not outdo the times of steamers using the shorter route. Today, of the tea clippers built, only *Cutty Sark* remains, restored and in permanent dry dock on the riverfront in Greenwich, an hour from London.

When the clippers docked in London, samples from each lot were sent posthaste to the tea traders in Mincing Lane. There tasters sampled the new arrivals to prepare themselves for the auctions. Over the years procedures, traditions and the "flavor" of the auctions remained much the same whether they were, as in the early days, at East India House or later at the London Commercial Sales Rooms and at Plantation House. Wearing top hats and crowding into the tiered seats rising above the auctioneer's dais, the tasters converged as often as four days a week to buy tea amidst genteel bedlam—indicating their bids by a raised eyebrow, a twitching nose or, if bidding got furious, by jumping up and down and yelling. Like the clipper ships, Plantation House is gone and the four-day-a-week auctions and hundreds of brokers have dwindled to a Monday auction at the Sir John Lyon House attended by several score traders.

Most tea-growing countries now hold their own auctions and companies like Twinings maintain agents in such cities as Colombo and Calcutta, who airmail samples to home office tasters and bid accordingly. But London, because it offers tea from all over the world, still plays a key role for the English tea companies.

Last summer I attended the London auction, where I met up with Sidney Mumford, a Twinings taster sporting mutton-chop sideburns and a conservative

Chests of tea sit on skids in the Twinings factory and warehouse at Andover, near London.

These professional tea tasters are at work in old-time New York—slurping, considering, spitting.

Tea tasting today in Twinings' Andover plant; Sidney Mumford, center, has been at it 25 years.

pinstriped suit. The Friday before he had tasted all the teas being offered and noted in his auction catalog the high and low price he thought each would fetch. His own expertise is Ceylon teas, and thus he will be particularly interested in those. Other brokers present are also bidding at Twinings' behest, so competitors cannot be sure who their rivals are for certain teas.

Traders from the biggest firms—Brooke Bond, Lipton's (SMITHSONIAN, August 1980), Lyons-Tetley, the Co-operative—dominate the bidding, which starts off languidly for some run-of-the-mill Indian teas. But when the Ceylons come on, the traders perk up. Amid much jovial banter, they bid spiritedly, the auctioneer neatly "knocking" each lot with his wooden gavel. White-coated assistants scurry in and out delivering orders and keeping the home office apprised of what's been bought or lost. Mumford, who has been a taster for 25 years, speaks wistfully of the grand auctions at Plantation House: "In those days it took half a week to get through all the bidding. Now we can finish it up in four hours."

But for all these evolutions in the trade, the basic growing and production of tea has remained remarkably unchanged over the centuries. Pluckers, usually women, still work their way through the densely planted rows up in hilly, isolated estates, picking the shiny, pointed leaves and buds off the new shoots. A good picker can pluck 70 or 80 pounds of leaves a day, which shrink to about 20 pounds of manufactured tea. The leaves are picked year round on most estates, though quality varies with the season.

Once gathered, tea is sent to the factory, where the leaves are spread on large flats for initial "withering" or drying. They are then rolled or cut, a process that gives a tea leaf its twisted, spiraled appearance. If the final product is to be the "black" tea familiar in the West, the leaves are allowed to "ferment" or oxidize for some hours before wafts of hot air "fire" the leaves and arrest the process. For green tea, commonly drunk in China and Japan, the leaf is immediately "fired" to avoid fermentation. Oolong tea is "semifermented."

The quality and flavor of each tea crop depends to a great extent on the location of the estate, how well it's run, the season and how much rain and sun there has been. However, like wines, certain areas and estates consistently produce fine teas. Among the most highly sought after are the quality Darjeelings, known as the champagne of teas, Keemuns, known as the burgundy of teas, and the Formosa Oolongs. To the professionals, terms like Orange Pekoe and Souchong are simply descriptions of leaf appearance and size and have no bearing on quality or taste. Tea traders get very upset when someone says, "Oh, I just love Orange Pekoe tea," because it's akin to discussing one's favorite kind of apple and saying you adore big apples, rather than Stayman or Golden Delicious.

Tea tasters are the backbone of the business, for they determine what teas will be bought and blended so that every cup of English Breakfast or Earl Grey maintains its distinctive flavor. William H. Ukers, in his classic two-volume work *All About Tea,* wrote: "It has been said that a tea taster, like a poet, is born, not made. Of course his faculties must be trained, but unless he has a delicate palate and an exquisite sense of smell to begin with, he will never be an expert judge of teas. . . . The tea expert not only has to appraise the value of thousands of pounds worth of tea by merely tasting a sample, but he is expected to know how the various samples of different teas will blend together."

The Twinings tasting room is located at its factory

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warehouse in Andover, a bucolic rural site about an hour out of London. A wide skylight diffuses the clear northern light thought ideal for scrutinizing the hundreds of samples that arrive daily. Mumford, or one of Twinings' two other tasters, has the assistants set up about 60 heavy white porcelain cups across the long counter (p.104). The tea samples are carefully weighed out, one to each cup, freshly boiled water from copper kettles is poured in, and a lid is put on for three to five minutes while the teas brew. The tea, or "liquor" as the tasters call it, is then drained off into a small white bowl, and the lid, filled with boiled leaves, left to sit atop the cup.

Sidney Mumford starts down the line, inhaling a large spoonful of each tea with a whoosh, swirling it onto the taste buds on the back of his tongue, and then spitting into a spittoon that travels along with him on a stainless steel gutter. Slurp, consider, spit, slurp, consider, spit, and so on down the line with great speed. Tea is judged by its appearance, aroma, and the strength, pungency and flavor of the liquor. Mumford, like all tasters, takes in these qualities in a few seconds and determines if Twinings is interested, what they're willing to pay, and what teas this could be used to blend—Indian Breakfast, Vintage, English Breakfast, and so on. Inevitably, every tea taster is asked if he really drinks tea after a day spent sampling hundreds of varieties. For Mumford, the answer is a firm yes—with a preference for Ceylons and Darjeelings.

While Twinings is certainly one of England's oldest, most distinguished tea traders, it also prides itself on its computerized, modern plant and its vigorous export program. Samuel H. G. Twining heads the export division and his genuine enthusiasm for everything to do with fine teas makes him an ideal emissary as Twinings seeks new converts. Twinings has parlayed its heritage and fine reputation into sales overseas to more than 90 countries. (The United States is its fifth largest customer.)

In its low-key crusade to persuade the world that tea is even better than coffee (which Twinings also sells in England) Twinings has found its best weapon is Earl Grey, a fragrant blend scented with oil of bergamot (a citrus fruit). Legend has it that the "recipe" was sent to Earl Grey when he was Prime Minister in the 1830s by a Chinese mandarin whose life had been saved by an English diplomat. The blend's distinctive taste has weaned many coffee drinkers onto tea, says Twining. Recent concern about caffeine also has acted in wooing new tea drinkers: a cup of tea, depending upon how it's brewed, has about half the caffeine of a cup of coffee.

Twining, a genial man given to "jolly good," started as a "pot boy" in the company tasting room and worked his way up. As a frequent company spokesman, he handles with grace questions on how to make a good cup of tea (use cold, fresh water; when it's boiling merrily, pour it onto the tea—leaf or bag—and allow it to steep three to five minutes), and what kind of tea he prefers to drink.

"I think of teas as rather like wines," he says. "You drink different ones for different times and to suit your mood. In the morning, I like English Breakfast. I find it a brisk tea that gets you going. After lunch I like a nice Darjeeling. It's pleasant and soothing. If it's hot and I've been gardening or playing tennis, I find Lapsang Souchong with cucumber sandwiches to be refreshing. After dinner, scented tea like Jasmine or Earl Grey is perfect. But it really depends on what you like."

This array of pots and sterling tea sets is from the Cooper-Hewitt Museum collection in New York. "Giant Teapot" holds 345 cups, was made in England, painted in China for the 1851 Crystal Palace show.

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By Benjamin Forgey

Straight lines and right angles were very much 'The Style'

Stedelijk Museum, Amsterdam

Gerrit Rietveld's end table is a pure application to furniture design of De Stijl esthetic theory.

National Gallery of Art, Washing

Piet Mondrian's *Diamond Painting, Red, Yellow, Blue,* circa 1925, is prime example of the master's ideas.

In October 1917, as World War I lurched into its final paroxysms, the first issue of a little avant-garde magazine quietly made its appearance in neutral Holland. Its very name, however—*De Stijl* (*The Style*)—announced far-reaching ambitions. Sheltered from the war, the loosely knit group of artists and architects who founded the magazine nurtured the cause of modern art and a dream of better things to come.

The idea for the magazine was hatched and promoted by Theo van Doesburg, an intense artist of 34 who had been demobilized after spending two years of military duty on the Dutch border. Beginning as a monthly and published intermittently during the 1920s, *De Stijl* was one of a handful of European periodicals in which the major artistic battles of the time were fought. It is the only one of these journals that is widely remembered today, in part because of van Doesburg's amazing energy as an editor and all-

In Holland in the Twenties, an avant-garde magazine and a handful of artists like Mondrian tried to create a concept of order

Rietveld's red-blue chair of 1918, a contentious piece to this day, was revolutionary at time.

Stedelijk Museum, Amsterdam

around esthetic impresario, in part simply because *De Stijl* was an unforgettable title. (Imagine its fate had van Doesburg gone with his original inspiration and called it *The Straight Line*.) Mainly, though, we associate the name of the magazine with the achievements of the artists who defended and reproduced their work in its pages.

These achievements are recalled and celebrated in the exhibition "De Stijl: 1917-1931, Visions of Utopia," which has just opened at the Walker Art Center in Minneapolis. The exhibit, one of those large, cohesive, international undertakings that turn the oft-tarnished image of the "blockbuster show" to good account, will appear in late April at the Hirshhorn Museum and Sculpture Garden in Washington and then depart for Holland. (The exhibition is one of many events—art exhibitions, concerts, visiting trade delegations and a visit to the United States by

Stedelijk Museum, Amsterdam

Van Doesburg's *Countercomposition V*, 1924,
stresses diagonal tension rather than plane-relation.

Queen Beatrix and Prince Claus, the first visit by a reigning monarch of the Netherlands in three decades —celebrating the 200th anniversary of the opening of formal diplomatic relations between the United States and the Netherlands.

We tend to remember De Stijl best in the works of its painters, particularly in the towering lifework of Piet Mondrian, but the exhibit attempts to focus on the encompassing breadth of the entire De Stijl enterprise, and thereby illumine its tremendous influence upon 20th-century architecture, city planning, interior and furniture design and typography as well as painting. Organized by the Walker, the exhibition received major funding from the National Endowment for the Arts, the National Endowment for the Humanities, Champion International Corporation and the government of the Netherlands.

De Stijl (correctly pronounced like "stale," as in old bread), was not really a movement in the customary sense of being a cohesive, consistent group endeavor. Indeed, its history was characterized by extraordinary arguments between participants and an almost continuous shifting of allegiances over this point or that. The most famous disagreement came in 1925 when

Mondrian severed relations with his good friend van Doesburg because the latter had introduced diagonal lines into the established horizontal-vertical divisions of De Stijl painting. As he tersely explained to van Doesburg, "After your arbitrary correction of Neo-Plasticism [Mondrian's term for geometric, vertical-horizontal art], any collaboration, of no matter what kind, has become impossible for me."

Nonetheless, as the exhibition demonstrates, there are many important affinities between the various artists and the different disciplines. This is fundamentally a visual matter: a chair designed by Gerrit Rietveld, a facade by J. J. P. Oud, an advertising design by Vilmos Huszar, a building model by van Doesburg and Cornelis van Eesteren, and a painting by Mondrian do, whatever their differences, look a lot alike. Almost as important, it is a question of why these disparate art objects, artifacts and architectural spaces appeared more or less at the same time and place—a question of esthetic attitudes and how they came about.

Van Doesburg conceived of *De Stijl* as "a periodical of an intimate character" that would enable "the truly modern" artist to fulfill his "double vocation." That is, "in the first place, to produce the purely plastic work of art, in the second place to prepare the public's mind for this purely plastic art." The close connection between practice and theory was seen as crucial by the De Stijl artist and the other avant-gardists, and this helps to explain the intensity of the polemics: the authors in *De Stijl* and the other publications, far from being dispassionate critics, were themselves the creators. The debates were often couched in messianic terms and the participants strongly believed themselves to be fighting over the future of the new order.

In their use of straight lines intersecting at right angles, in their architecture of unornamented planes and in their restricted organization of colors (in Mondrian reduced to the three primaries—red, yellow and blue—plus black, white and shades of gray), the De Stijl artists believed they had penetrated the secrets of nature to discover a valid universal style, the harbinger of a new spiritual order. This style was, in theory, to be a collective enterprise, a way station on the path to the disappearance of subjective, individualistic art. Although in the long run De Stijl's emphasis upon the spirituality of art was to cause a break between its adherents and the leading artists and architects of the Bauhaus school in Germany, the writers in *De Stijl* initially were almost as accepting of and as optimistic about the machine and technological esthetics as the other avant-garde movements. And like the Bauhaus

Benjamin Forgey writes on architecture and art for the Washington Post. *He last wrote on the Phillips Collection in the May 1979* SMITHSONIAN.

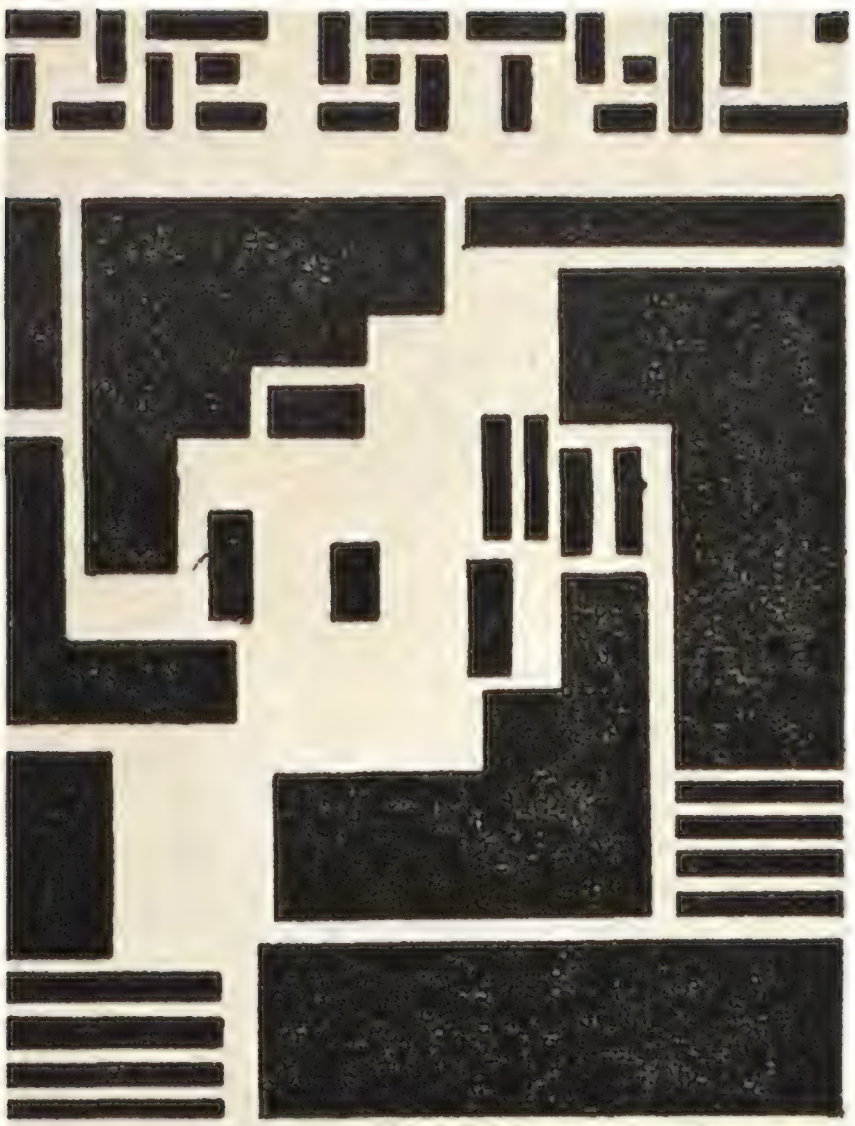
Stedelijk Van Abbemuseum, Eindhoven

Van Doesburg's ink and gouache study, *Flower Room,* was design for room built to its specifications.

Stedelijk Van Abbemuseum, Eindhoven

Originally built from design above in 1925, version shown here was reconstructed in 1968.

Haags Gemeentemuseum, Netherlands



Vilmos Huszar's design for *De Stijl* cover was the motif used for all covers of first volume.

program—indeed, in advance of it—De Stijl early on embraced the principle of the unity of all the arts.

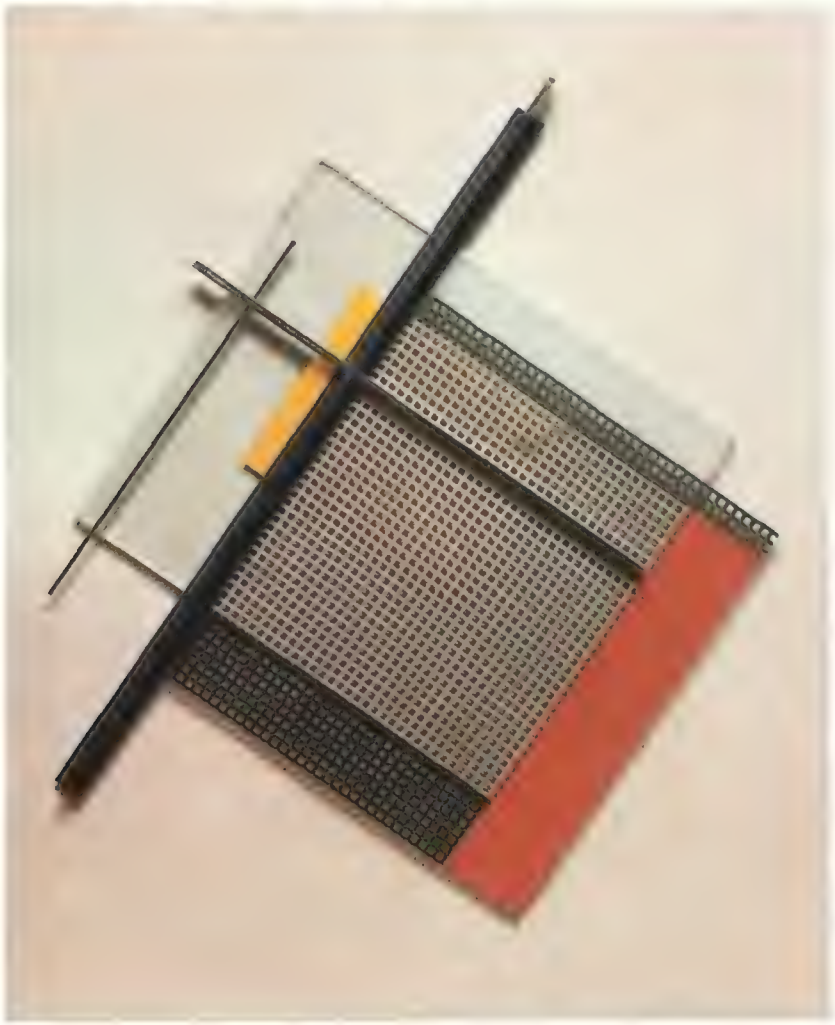
Throughout his mature career (he died in 1931), van Doesburg was the epitome of this principle. A superb painter overshadowed only by the genius of Mondrian, he designed beautiful stained-glass windows and tile floors and murals for spaces designed by others, and his own contributions to architecture, if largely theoretical, have been too easily passed over. Even Mondrian, in his monkish way, lived the doctrine of the unity of art and life. His studios in Paris and New York became famous in the art world as sternly habitable, three-dimensional versions of his visionary paintings. Mondrian's fervent involvement with *la vie moderne* is not without its amusing sides. A more unlikely aficionado of jazz would be hard to imagine, but he loved it and would dance stiffly late into the night almost as if he were one of those lively little red rectangles in his late New York painting *Broadway Boogie-Woogie*.

To believe so thoroughly in the new, which during the First World War and the next three decades was a way of believing in the future, obviously implies rejecting the old order. The De Stijl artists shared a profound hostility to post-Renaissance Western culture with all of the avant-garde European movements. Thus it is not so surprising as at first it seems to find van Doesburg and Mondrian, orderly Dutchmen to their toes in their art and in many other respects, signing letters to each other "Dada Does" and "Dada Piet." Dadaism, like De Stijl born during the war in a neutral country, had many faces, but above all it was a revolt against the culture that had produced the carnage of the war.

For van Doesburg and the other radical modernists the proscription of the past applied across the board. In painting, it meant elimination of representational reality and spatial illusion—doing away with the Renaissance window on the world. In architecture, it meant erasing decoration ("ornament and crime," in Adolf Loos' pairing), opening up conventional box-like rooms and forswearing outmoded materials such as brick and stone. In sculpture, it meant jettisoning figuration as well as traditional mass; in music, revising harmonic structure; in typography, escaping standard alignments and notions of content; and so on.

If De Stijl was universal in its aims and international in its influences, it was also, as has been often noted, an extremely Dutch phenomenon. Art historian Hans L. C. Jaffé probably is correct when he

Hirshhorn Museum and Sculpture Garden



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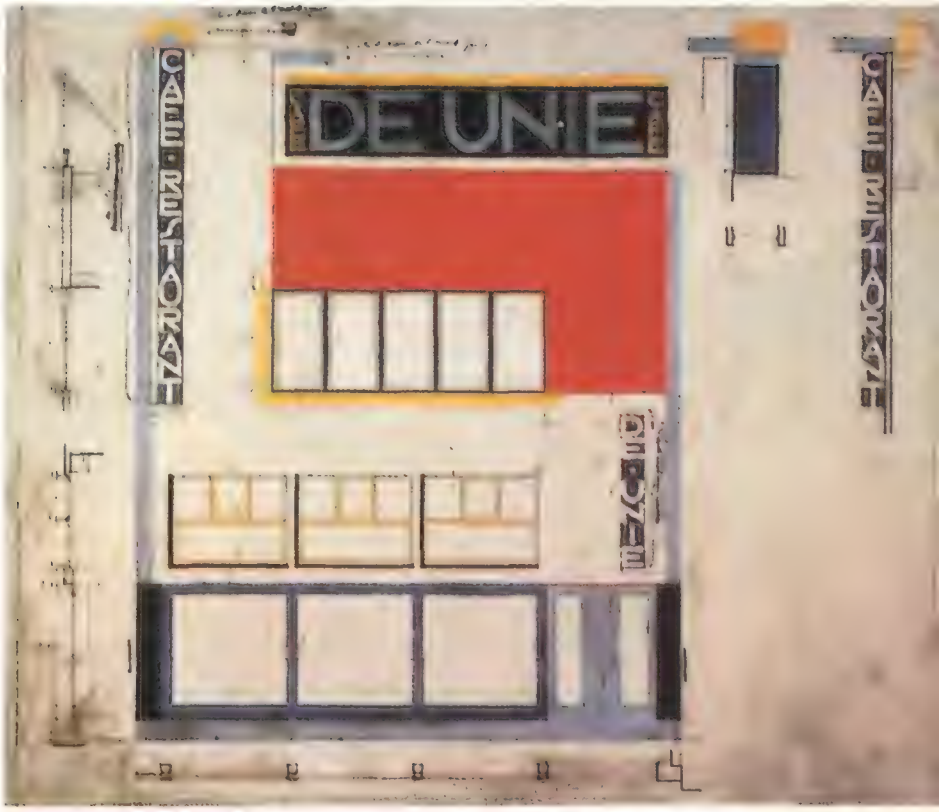

An architectural drawing, 1925, by J. J. P. Oud, of design for the Café De Unie, built in Rotterdam.

Simple materials and design of César Domela's *Relief Construction No. 11A* exemplified De Stijl theory.

argues that "it is not going too far to assert that this art could not have originated in any other country," although De Stijl painting clearly is unimaginable without the prior example of Cubism. In their stupendous collaborative enterprise, Georges Braque and Pablo Picasso had discovered the analytical tools necessary to achieve radically abstract painting before they themselves backed away. Like Kasimir Malevich and other Russian painters of the same period (SMITHSONIAN, December 1980), each of the original De Stijl painters—Mondrian, van Doesburg, Bart van der Leck and Vilmos Huszar—had to assimilate the geometrical lessons of Cubism before moving on. Mondrian led the way. He went directly to the source, traveling to Paris in December 1911, and returning to Holland only because of the outbreak of war in 1914. His systematic studies of trees, a church facade and an ocean-side view, in their progressive, intensely analytical "disintegration," remain as one of the extended creative moments of 20th-century art.

But the Dutchness of De Stijl painting is inescapable. There are ample precedents in Dutch art, from the geometrical clarity of Jan Vermeer and Pieter de Hooch in the 17th century to the mystical yearning for identification with the forces of nature of Vincent van Gogh in the 19th century. And, as Jaffé argues, the Dutch landscape and De Stijl esthetics have a common origin. "The Dutch landscape is an artifact," he writes, "its appearance has been imposed on it by principles of economical expediency and practical sense, following the fundamentals of Euclidean geometry. . . . The straight line and the right angle are the signs of Man's struggle against nature and of the eventual triumph of Man's labor over its capricious power. . . . It is for the very same reasons that the straight line and the right angle dominate in the work of De Stijl. . . ."

This argument is persuasive even if one can almost hear Mondrian and van Doesburg object—emphatically—that their intentions were not to dominate nature but to give form to its essential structure. Like the Russian painter Wassily Kandinsky, Mondrian was attracted to the esoteric, spiritualist doctrines of Theosophy, emphasizing a mystical progression from matter to spirit. In Holland during the war years, Mondrian and van der Leck eagerly discussed esthetics with their neighbor, the philosopher M. H. J. Schoenmaekers, "both mystic and mathematician," as Jaffé describes him, "who believed that . . . with the aid of mystic concentration he would be able to plot the path to knowledge and understanding of the structure and meaning of the universe."

In 1915 Mondrian exhibited some of his recent works in a group show at the Stedelijk Museum in Amsterdam—the first opportunity for his countrymen to see what their gifted compatriot had been up to in the years since he had left for Paris. One of the more

Haags Gemeentemuseum, The Hague

Mondrian made his studios three-dimensional versions of his paintings; this was in Paris, circa 1930.

enthusiastic responses came from van Doesburg, who declaimed in a review of the exhibition that Mondrian's colors provided him with "an elementary pure impression of art." Mondrian was 43 at the time. Van Doesburg, 11 years his junior, found what he was seeking in Mondrian's art. He wrote to Mondrian in Laren, an artist's colony near Amsterdam where Mondrian and van der Leck were living out the war years, and the three artists soon met, establishing the genesis of *De Stijl*. At first, the older painters (van der Leck was then 39) hesitated when presented with the idea of founding a magazine, but van Doesburg was extremely persuasive.

Van Doesburg settled in Leyden when he got out of the army in 1916, meeting the painter-graphic designer Huszar and a number of architects who were to become founding members of *De Stijl*. He kept in close touch with the Laren pair, however, exchanging letters and visits. This is documented, but even if the hard evidence were lacking one could assume as much from the paintings of the three artists. The closeness of their researches into "abstract reality" during 1917 manifested itself in a series of canvases (flat rectangles of solid hue floating on a lighter ground) that are as hard to tell apart as the early Cubist pictures Braque and Picasso had painted some six years earlier. This brief, intense period was as close as the De Stijl artists ever got to their professed ideal of a collective, unified style. Eventually, of course, individual temperament won out. Van der Leck, no joiner, withdrew from the magazine the year after it first appeared, returning to a clean, epigramatic form of figuration. And Mondrian split with van Doesburg over the issue of the diagonal.

For both men the issue possessed a somewhat theological character—one does not idly introduce a dynamic new element into a hard-won scheme whose main point is its universal harmony. (It is nice to know, however, that their absolutism and the resulting formal break did not permanently damage their personal relationship. They were able to repair their friendship rather quickly.)

Ironically, despite his banishment of the diagonal, among Mondrian's more stunning achievements as a mature painter are the diamond-shaped canvases wherein, as Max Bill, the brilliant Swiss architect/theorist, observed, "the horizontal-vertical order is broken—not the rhythm and alignment, but the outer boundary." The exhilarating expansiveness of these "squares that stand on one corner," whose edges thus become diagonal lines in relation to the room and their internal components, is enormously different from the balanced calm of the rectangular paintings held parallel to the ground. Happily, Mondrian the painter did not let Mondrian the ideologue stand in his way.

One of the reasons Mondrian and van der Leck had balked when van Doesburg's idea for a magazine was placed before them was the latter's insistence that architecture was an integral part of the new "purely plastic art." Theory aside, van Doesburg correctly perceived that architecture in Holland, as elsewhere, was in a state of stylistic and intellectual ferment altogether comparable to the revolution in painting. Spurred by the example of the massive, clean-walled turn-of-the-century stock exchange building in Amsterdam by H. P. Berlage and, through him, by Frank Lloyd Wright, younger Dutch architects such as J. J. P. Oud, Robert van't Hoff and Jan Wils were struggling to create an art of building equal to the esthetic, ethi-

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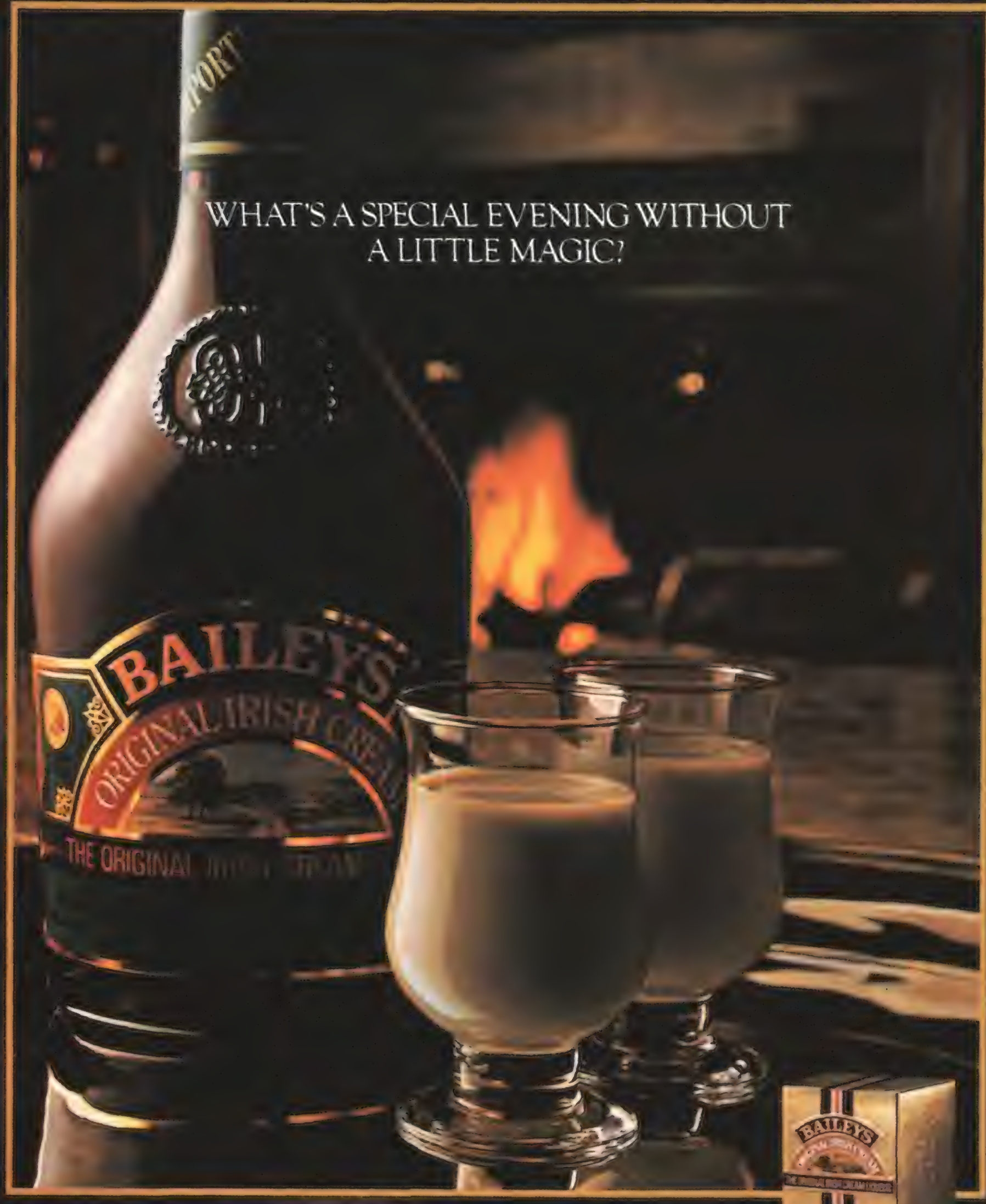

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cal and functional challenges of the new age. Ever the enterprising idealist, van Doesburg interested each of these talented architects in collaborative projects and they joined him in the founding of *De Stijl*.

Although in many respects their subsequent efforts in building and city planning ran parallel to the development of De Stijl esthetics, none of these architects appears to have appreciated the heady theoretical intensity of the art-world debates, and they retired quite early from the magazine. Van Doesburg was always able to enlist new recruits, however. The most important of these was Gerrit Rietveld, the furniture maker whose red-blue chair of 1918 (p. 111) is, as scholar Kenneth Frampton points out in a catalog essay, "the first attempt at a dematerialized, neoplastic architecture." In this chair we see the severe planes of De Stijl painting set free in three-dimensional space. However, no other artifact in the modernist canon has attracted so much derision from opponents of modernism as Rietveld's chair. Perhaps the criticism is justified—if not literally unsittable, the chair obviously is uncomfortable—but for this very reason no other object quite so poignantly embodies the utopian aspirations of the De Stijl artists.

A new role for architecture

The chair, in any case, anticipates many of the principles van Doesburg would enunciate in his 16-point manifesto, "Towards a Plastic Architecture," published in 1924. Mondrian, perhaps wisely, stuck primarily to the metaphorical domain of painting, but one cannot help sympathizing with van Doesburg's belief in the totality of architecture, in "architecture as the synthesis of Neo-Plasticism." Architecture satisfied not only van Doesburg's persistent interests in actual space and the dimension of time; it also provided a true test of the principle of synthesizing the separate arts. To van Doesburg, the idealistic painter, color was "not a decorative or ornamental part of architecture but its organic means of expression."

This longing for a total, and totally new, art form was widespread at the time van Doesburg wrote those words, and in practice it could only be served in three dimensions, that is, by sculpture (or painting) that took on the spatial attributes of architecture, or architecture that subsumed the other arts. Significantly, El Lissitzky, the Russian contructivist, turned his attention toward three-dimensional ends at about the same time as van Doesburg, making drawings and full-scale models he called "prouns" (an acronym for Project for the Affirmation of the New). El Lissitzky first defended his new position in a lecture entitled "Prouns: a Changing-Trains between Painting and Architecture." Not surprisingly, El Lissitzky and van Doesburg met in Berlin and Weimar in the early 1920s, and the pair collaborated for a brief period before the inevitable falling out.

What distinguished the De Stijl conception was its uncompromising purity. Consequently, there are relatively few existing monuments of De Stijl architecture. The house that Rietveld designed for Madame Truus Schröder-Schräder in Utrecht, completed in 1924, fulfills many of van Doesburg's standards for clarity and openness, and it remains one of the pristine icons of early modernism. This would be joined by the interiors designed by van Doesburg together with French artists Jean Arp and Sophie Täuber-Arp in the late 1920s for the Café Aubette in Strasbourg, had they not been remodeled out of existence by the end of World War II. Probably the most persuasive, dynamic embodiments of the architectural ethos of De Stijl never got built. These were the remarkable plans for a private home designed by van Doesburg and Cornelis van Eesteren in 1923 and displayed in Paris that year. In a way, this is fitting. De Stijl was not entirely of this world.

In his last years van Doesburg lived in a studio/house he designed for himself in Meudon, a suburb of Paris. He had hoped to convert that house into a center for revived De Stijl activities, but his death at 47, in 1931, intervened. By that time, in any event, a younger generation of artists had come under the sway of De Stijl ideas—their effects still evident today in art, architecture and design.

Walker Art Center, Minneapolis

Interior today of the Rietveld/Schröder house, Utrecht. At right is Rietveld's original conception.

Courtesy Rietveld Foundation

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An Arabic explanation of the Pythagorean theorem, 1258 A.D. (Courtesy of the British Library)

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By Dorothy Herrman

Robert Benchley: bothered, bewildered but a brilliant wit

Drawing of boulevardier Benchley by Gluyas Williams appeared on title page of *Benchley Beside Himself.*

He couldn't tie his necktie without trauma, but he illuminated the Algonquin Round Table when 20th-century humor was at its brightest

It has been said that wit is aggressive by nature. Wit—more often than not—laughs at, rather than with, its object. Many wits have been angry, tormented and insecure people who have used their talent to strike out at others. Yet the life and career of Robert Benchley give evidence that it is possible to be a wit and a kindly person too. Indeed, Benchley was so pleasant a man that people said his presence in a room made all its occupants feel better. Dorothy Parker found him one of the most delightful men she had ever met. Even John O'Hara, who was ordinarily skeptical about most of his contemporaries, said, "I cannot think of anyone who has not been advanced spiritually, culturally and . . . even financially by association with Mr. B."

Robert Benchley was one of the original Algonquin Round Table wits, but his wit was rarely malicious or backbiting or aggressive. He did poke fun at other people's absurdities, but more often concentrated on describing his own fears and inadequacies when faced with the dangerous business of daily life. Although Benchley was a Harvard graduate, a brilliant writer and a bon vivant, he liked to portray himself as a bumbler, a vague, helpless person who was always unsure of himself in a strange, bewildering world. His charm lay in his gentleness and air of constant perplexity. He gave the impression that no matter how hard he tried to understand life, it never made much sense. He hid behind this image so successfully that very few people ever knew the real Benchley.

A portly man with a round, bemused face, a toothbrush moustache and dark, neatly parted hair, Benchley let it be known that his life was a ceaseless struggle against inanimate objects. Typewriter ribbons and wrappers seemed bent on conspiring against him. "It may be a perfectly dandy wrapper, air-tight, watertight and germ-proof, but if the buyer has to send it to a garage to get it off, something is wrong somewhere," he once said.

Obviously, he needed a secretary to help him cope with the hazards of modern life. He found one in the person of Charles MacGregor. Benchley sensed that for him MacGregor would make a perfect secretary because when they were introduced, MacGregor was holding a bouquet of flowers and told Benchley that he wasn't taking them to his mother or his sweetheart

As a child, Benchley wanted to join the Worcester Fire Department, later settled for honorary title.

In this pose Benchley demonstrated the finer points of filleting indoors.

but to a shirt in the shirt hospital.

Such a man was a perfect foil for one who loved whimsy as much as Benchley—and, as time went on, MacGregor showed a remarkable talent for invention in the Benchley style. One of his duties was to get Benchley out of bed every morning. In a biography of his father, the late Nathaniel Benchley wrote that MacGregor "was a genius at waking a person gently and inoffensively. He would walk into the bedroom and say, very quietly, 'The men are here for the trunks,' and Benchley would be thrown into an immediate turmoil of activity, stumbling about the room and groping for clothes to put into the nonexistent trunks. By the time he realized it was all a ruse, he was as wide-awake as a third baseman. Naturally, MacGregor didn't say the same thing every morning; he varied it with such things as, 'There are some men here to flood the bed for skating.' "

The practical joke, which has long since lost its cachet among the sophisticated, was a favorite form of humor in Benchley's day, and he was a master of it. About 1940, when he was out in Hollywood making a series of movie shorts, he contracted pneumonia. A doctor was sent for. He prescribed a sulfa drug, then considered miraculously effective. Benchley took the drug as ordered, and on the day that the doctor was due to return, he and a friend ripped open a bed pillow and painstakingly glued all the goose feathers inside it to Benchley's body.

When the doctor arrived and examined Benchley, he asked if there had been any bad effects from the drug. Benchley said he didn't think so, although there was one minor symptom that baffled him a bit. So saying, he tossed off the sheet, revealing the goose feathers.

How To Sleep won Benchley an Academy Award for best comedy short in 1935.

Robert Charles Benchley was born on September 15, 1889, the second son of Charles Henry Benchley, the mayor's clerk in Worcester, Massachusetts, and Marie Jane Moran, or Jennie as she was called, an exceptionally strong-willed woman of pronounced tastes and violent prejudices. Her loathing for alcohol in any form was equalled only by her hatred of trees—based on the fact that trees had a longer life-span than people.

Her first son, Edmund, was born in 1876. A tall, handsome boy with a whimsical sense of humor, he was her favorite child. When he was killed by a sniper in the Spanish-American War, she was heartbroken and sobbed, "Oh, why couldn't it have been Robert?" This outburst was overheard and repeated all over town.

After Mrs. Benchley had pulled herself together, she was horrified by what she had said and reacted by pampering Robert inordinately.

Robert went to Exeter, where his sense of humor took the form of rebellion against class assignments. When told to write an essay on something practical, he turned in a paper entitled "How to Embalm a Corpse." To prepare for it, he took a few lessons from the local undertaker.

Benchley went on to Harvard, where he endeared himself to his classmates by drawing cartoons for the *Lampoon*, the college humor magazine, and telling jokes. He delivered a speech, "Through the Alimentary Canal with Gun and Camera," and later became the *Lampoon*'s president. At commencement, he gave the Ivy Oration. His speech was a nonsensical confection that parodied the usual academic address. It was received with a standing ovation.

In the spring of his senior year at Harvard, he became engaged to Gertrude Darling, whom he had known since the age of eight. During his

Tying a bow tie was one of those routine daily tasks that eluded Benchley.

This article is adapted from With Malice Toward All *by Dorothy Herrman, published by Putnam's.*

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Benchley struck an uncharacteristically serious pose for this 1910 portrait.

first years after college, he worked at a series of jobs that he was ill-suited for: he was a secretary at the Boston Museum of Fine Arts, and then an editor and advertising writer for the Curtis Publishing Company. Here, he was always being told that his work "lacked punch." Perhaps simply to prove that he wasn't altogether humdrum, or in the spirit of his old college waggery, he donned a red wig and false beard at the annual convention and passed himself off as a Mr. Constantine, president of a Seattle advertising agency. When he was asked to make a speech, he seized the opportunity of lambasting the business practices of the Curtis Publishing Company to such an extent that Mr. Curtis had to be restrained from leaping to his feet. When his speech was finished Benchley ripped off his disguise. There were titters of embarrassed laughter and then a dreadful silence.

After being threatened with dismissal by his next employer, the Russell Paper Company in Boston, Benchley finally got a job working as a reporter with the *New York Tribune*. He then moved on to the staff of

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Dorothy Parker was one of Benchley's closest friends as well as a fellow wit.

its Sunday magazine section. One might have hoped this would have been a perfect job for Benchley, but he rated himself "the worst reporter, even for his age, in New York City." According to his son Nathaniel, "the main reason for this was that he lacked the ability, or the nerve, to ask people questions that he considered none of his business." Once when he was assigned to cover an affair at the Colony Club and was told that reporters were not welcome at the event, he returned to his desk and jotted down a description of the club's doormat. The *Tribune* did not print his article.

But as time went on, his articles gained him a reputation as a wit and sophisticated stylist. One of the first pieces he wrote for *Vanity Fair* he called "No Matter from What Angle You Look at It, Alice Brookhausen Was a Girl Whom You Would Hesitate to Invite into Your Own Home."

When the *Tribune* magazine folded, Benchley worked briefly as a press agent for Broadway producer William A. Brady, served a brief stint in Washington, D.C., and came back for a short time to the *Tribune* before he was hired as managing editor of *Vanity Fair*. It was at this juncture that he met Dorothy Parker, then *Vanity Fair*'s drama critic, and Robert Sherwood, its drama editor. All three soon became fast friends, although they continued to call each other Mr. Benchley, Mrs. Parker and Mr. Sherwood. Sherwood, a quiet, slow-talking man, was six feet seven inches tall, Benchley six feet, and Dorothy Parker a petite five feet. Benchley's son remarked that seeing them together was like looking at a "walking pipe organ."

At *Vanity Fair*, Mr. Benchley, Mrs. Parker and Mr. Sherwood spent much of their time and talent having fun entertaining themselves, often to the dismay of their superiors. One day a memo was circulated saying that any employee who told anyone the amount of salary he was getting would be fired. Dorothy and the two Roberts all made signs specifying their salaries, and hung them around their necks.

When another office dictum stated that anyone who was late to work must fill out a slip detailing why, Benchley reached for a piece of paper and in a microscopic scrawl explained the reason why he had been 11 min-

Robert Sherwood joined Benchley and Parker at *Vanity Fair* and the Algonquin.

America's Hidden Energy Crisis

ELECTRIC UTILITIES IN JEOPARDY MEAN A NATION IN JEOPARDY

By Alvin L. Alm

**Director, Energy Security Program,
Kennedy School of Government, Harvard University**

Alvin L. Alm has been involved in analysis and direction of U.S. energy policies for many years. He served on the White House Energy Policy and Planning staff in 1977 and was Assistant Secretary for Policy and Evaluation in the U.S. Department of Energy 1977-1979. Previously, he was Assistant Administrator for Planning and Management in the U.S. Environmental Protection Agency.

The investor-owned electric utility industry is in financial trouble. State public utility commissions, reacting to public anger over rising electricity rates, have squeezed utility earnings and returns to investors so that capital improvements have been delayed or denied.

Some of the effects of short-sighted utility regulation will be felt soon, others will be passed on to our children. All are reasons for urgent national concern now:

1. Cutting utility earnings or curtailing capital investment will eventually cost the public more money.

Lower credit ratings and equity values resulting from eroding earnings increase interest costs which are eventually borne by the consumer. Deferral of needed capital investments will only shift costs to the future.

2. Continued deferral of capacity investments may lead to serious reliability problems in some areas, including brown-outs and black-outs.

Demand growth remains high in some regions. In some low-growth areas, demand forecasts may be unusually conservative and demand may accelerate because of changing economic factors. With so much of our economic future tied to electricity-intensive high technology industries, it is vital that we have sufficient capacity to keep the electric system dependable. If necessary investments are not made, electric utilities could follow the same downward spiral of services that railroads have experienced.

3. Substantially higher rates or less reliable service could drive industry, jobs and taxes right out of the country.

A number of foreign countries are now courting new manufacturing industries with the lure of cheap and dependable electricity. An undependable electric system might prod many U.S. firms to embrace these offers.

4. Lack of capital to reduce oil use adds to higher inflation, balance of payment outflows and decreased national security.

Many electric utility capital requests to finance projects to "back out" oil are denied because they would initially raise electric rates. With our current level of vulnerability, continued use of oil for baseload generation makes no sense.

Given these compelling reasons, can we rescue our investor-owned electric utility industry without government bail-outs and fast enough to avoid chaos? It seems to me that progress along the following lines is essential:

Utilities must be able to earn a rate of return comparable to equivalent investments.

Returns that are considerably below low-risk money market funds or utility bonds, and even lower actual cash earnings, are sapping utilities' strength and causing capital costs to increase.

Utilities should be rewarded for cost-savings improvements.

These improvements would include reducing capacity additions and oil use — the two most significant reasons for rate increases.

Public utility commissions must permit company managements to be more innovative.

Utilities must be able to meet future needs through measures that make sense in their service areas, including conservation, rate reform, cogeneration, small-power technologies as well as more efficient generating facilities.

Restoring the financial integrity of investor-owned electric utilities is crucial if this nation is to have a strong economy and a healthy society. An industry that is financially strapped, heavily in debt and enervated from constant battles with state regulatory commissions is in no shape to meet urgent national needs. Through reasonable regulation, state commissioners will serve not only the interests of the people of their individual states but also of the nation as a whole.

Alvin L. Alm

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Drama critic Benchley attended the Broadway opening of *Jubilee* in 1935.

utes late for work that morning. On his way to his office, he had been told a herd of elephants had escaped from the Hippodrome and was about to board ship at the docks. In the interests of preventing a calamity at sea, among other things, he had helped round them up and return them to the Hippodrome.

After a number of such episodes, the management finally took action. Dorothy Parker wrote an unflattering review of Billie Burke's performance in a play by Somerset Maugham. Miss Burke and her husband, Florenz Ziegfeld, one of New York's wealthiest and most powerful men, protested vehemently. Parker was fired, and both Benchley and Sherwood, who felt she had been treated unfairly, resigned in protest. So she and Benchley decided to share an office together as free-lance writers. It was so small that Benchley said, "One cubic foot less of space, and it would have constituted adultery." Benchley's earnings as a free-lance writer were adequate, but he was delighted when he was offered the job of drama critic at *Life*, then a weekly humor magazine whose title was bought some years later by the pictorial weekly.

He insisted that he knew nothing about the theater or reviewing plays, but soon his witty critiques began to

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All thimbles shown actual size

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attract admirers. One of the high points of his career as a critic was his running battle with the long-lasting play of the Twenties, *Abie's Irish Rose*. When this drama of an Irish girl and a Jewish boy opened in 1922, it was universally panned. Benchley also damned it. The play proved to be a smash hit—and ran for the next five years. Part of Benchley's job at *Life* was to write "The Confidential Guide," a one-or two-line summary of every show in town. Confronted with the task of offering a weekly capsule critique of a play he thoroughly despised, Benchley at first wrote, "Something awful." As the play's run dragged on interminably, he began to create such descriptions as "Just about as low as good clean fun can get," or "People laugh at this every night, which explains why democracy can never be a success.

In 1922, Benchley appeared in *No, Siree!*, a revue originally written and acted by the Algonquin wits for a selected group of friends. Some well-known entertainers and artists appeared in this show (the offstage music was provided by Jascha Heifetz). Benchley's skit was entitled "The Treasurer's Report." Benchley maintained that it was conceived in a taxi on the way to rehearsal, and it was an inspired mishmash of mutilated figures and non sequiturs. When Benchley delivered his report the audience adored it. Irving Berlin was in the audience and was so impressed by Benchley's performance that he asked him to perform the skit in his *Music Box Revue*. Benchley agreed to act in the show, and a run on Broadway followed.

In 1929 he left *Life* to become drama critic at *The New Yorker*. For some time he had been writing the column "The Wayward Press" under the pseudonym of Guy Fawkes. A year earlier, in 1928, he had begun a movie career by filming *The Treasurer's Report* as a short subject. Audiences were tickled by his incomprehensible financial calculations and his self-deprecating little chuckle. During the course of his life, he would make 48 of these shorts for various film companies. Among his better-known film shorts are *The Sex Life of the Polyp, How to Raise a Baby* and *How to Sleep* (which won an Academy Award). They have been described as "Benchley humiliations recollected in tranquility."

Although Benchley enjoyed his job as *The New Yorker* drama critic, there

Donning top hats, this 1939 Hollywood gathering included (left to right) Bert Lahr, Herbert Marshall, Robert Benchley, David Niven and David Chasen.

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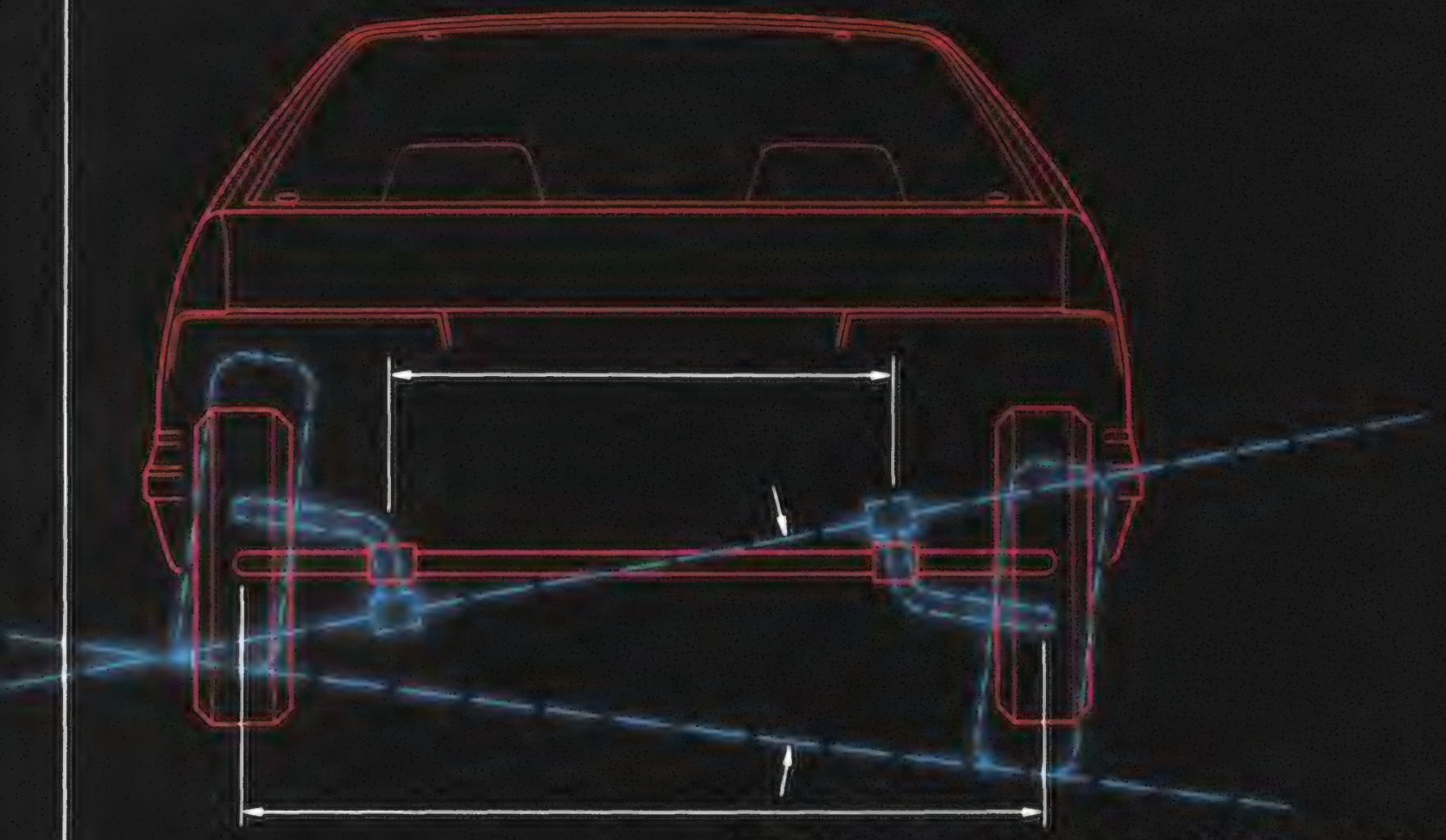
In 1940, Hitchcock featured Benchley and Joel McCrea in *Foreign Correspondent*.

was one part of the job he hated, and that was having to turn his copy in on time. Benchley wrote slowly; as soon as he finished a piece, he immediately found fault with it. Nathaniel recalled his father's confession that "It took me 15 years to discover that I had no talent for writing, but I couldn't give it up because by that time I was too famous." He often missed deadlines. Then waggishly he would send the editor a telegram, with a fantastic explanation as to why the piece was late. Or else he would get his mother, who still lived in Worcester, to send a wire supposedly signed by him, saying his copy was late because his mother was ill, and he was in Worcester with her until she recovered.

Once Donald Ogden Stewart, a friend of Benchley's, inadvertently told Art Samuels, editor of *Harper's Bazaar* and one of the recipients of a "mother-is-sick" telegram, that he had seen Benchley at a New York hotel only a half hour before. Then, realizing the blunder, he called Benchley and apologized for what had happened. According to Nathaniel, "Immediately, Benchley started sending telegrams to friends all over the country, and after an interval collect telegrams signed with his name began to trickle and then to pour into the *Harper's Bazaar* office, saying that he



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was in Santa Fe being inducted into a Navajo Indian tribe, that he was in Florida judging the Orange Blossom Carnival, that he was in Detroit inspecting the new Packard engines, that he was in Hollywood working on a picture with Greta Garbo, and that he was in Maine acting as a guide for a hunting party. Only the fact that the telegraph company refused to send collect cables from Europe kept him from having been in London, Chantilly and Rome. Finally, at the end of the day, a telegram arrived for him collect, from Samuels. It said, simply: "I GATHER YOU HAVEN'T DONE THE PIECE." Benchley also liked to send telegrams to his friends just for amusement. Once when he was in Venice, he cabled David Niven, "STREETS FULL OF WATER. ADVISE."

While Benchley was reviewing plays in New York, he moved to the Royalton Hotel. He had lived with his wife and two sons, Nathaniel and Robert jr., in the suburbs, but he thought it more practical to spend the week in town and go home on weekends. At first he had tried the Algonquin, but,

Benchley did not get the girl (Rita Hayworth) in *You'll Never Get Rich.*

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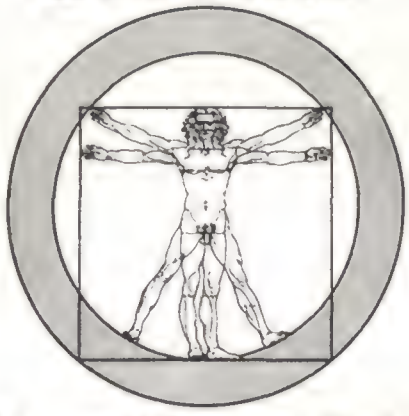

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In *Take A Letter, Darling*, Benchley played ring toss with Rosalind Russell.

distracted by friends dropping by his room or gathering downstairs, he moved across the street to the Royalton. Here he maintained a small suite which soon grew incredibly cluttered. Its rooms overflowed with Victorian furniture, photographs of Queen Victoria, a deer skull, old newspapers, busts of Sir Walter Scott and bookshelves full of old reading material including *The Culture and Diseases of the Sweet Potato* and *In and Out with Mary Ann*. There was also his typewriter, and a blue couch which Benchley called "The Track," saying as he lay down on it for a nap, "Well, it's time for a couple of laps around the track."

There are many stories to tell about Benchley: how he valiantly tried but never really mastered the art of using an airplane seat belt; how he hated being thought of as an intellectual and would slip a dust jacket of a murder mystery over his copy of Proust; how he always read footnotes and when they referred to another work, would not continue his reading until he had found and read the book referred to. Once, when he was very young, he had a heated argument about Lillian Russell's attributes with a policeman's horse.

The son of a mother who hated alcohol, Benchley was a teetotaler well into adulthood. After being persuaded to have a drink, he made up for lost time. He would start drinking at five in the afternoon and keep on until the early morning.

After he moved into the Royalton, Benchley's work habits may have improved but his nightlife continued to be as distracting as it had always been. Although devoted to his wife and family, he apparently had extramarital affairs, mainly with actresses.

Two of his favorite places to go as he grew older were "Tony's," a speakeasy owned by Tony Soma, and "21," where there is still a plaque over his favorite table inscribed with the words, "Robert Benchley, His Corner, 1889-1945."

There was a dark side to Benchley, but it was part of his credo never to

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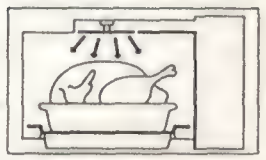

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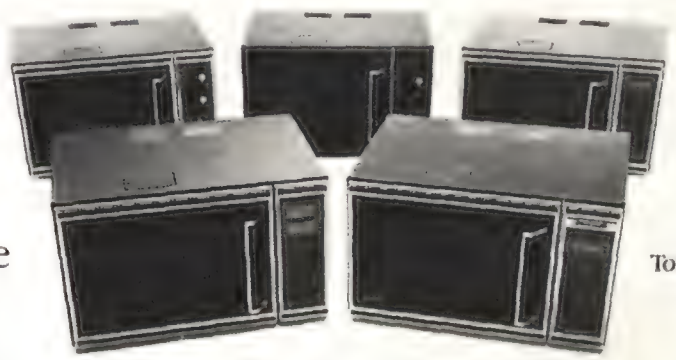

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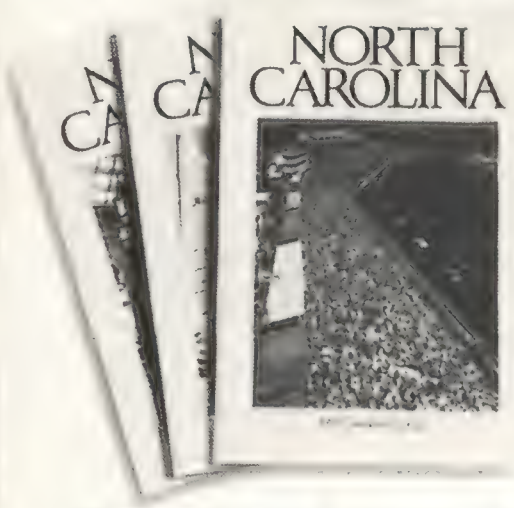

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show it. He merely had another drink and tried to think of something funny to do or say.

Yet such bonhomie wasn't always possible. In *The Twenties*, Edmund Wilson describes an evening spent with Benchley and Dorothy Parker in New York which gives a painful picture of Benchley's increasing use of alcohol and his lack of self-control during this period of his life. Wilson writes:

"'Do you mind going up to Tony's?' (it was inevitable that she [Dorothy Parker] should insist on going to one of their regular hangouts; they didn't know how to get along with anybody but one another). 'Mr. Benchley is sunk tonight, and I promised I'd go up there and see him' (it was one of their affectations that she always called him Mr. Benchley) . . . he was getting worse and worse in debt (his syndicate stuff began to show it—overdrafts on his Scarsdale bank), he would rush out to Chicago, where the mistress was playing, to lecture; the girl had been a waitress, then on the stage, he had met her in the Music Box Revue; he would say, 'She enters the room like a duchess!'—When I finally met her, she was quite a pretty blonde with thick ankles, who, however, I thought, had something of that hard-eyed prostitute stare, the result of there being no coherence or purpose in a woman's emotional life.—We drank a great many Tom Collinses. When we first came in, we had found Benchley with his red grossening face, leaning against the wall in the hall—talk of going down to the cellar to sing—he had got to a point where he no longer went at all to plays he reviewed for *Life*. . . ."

In 1943, at the age of 54, Benchley announced that he was quitting as a writer and was going to concentrate on radio and movie work. He felt that very few humorists excelled in their work as they got older and he was afraid he might lose his comic touch. Although his short films were

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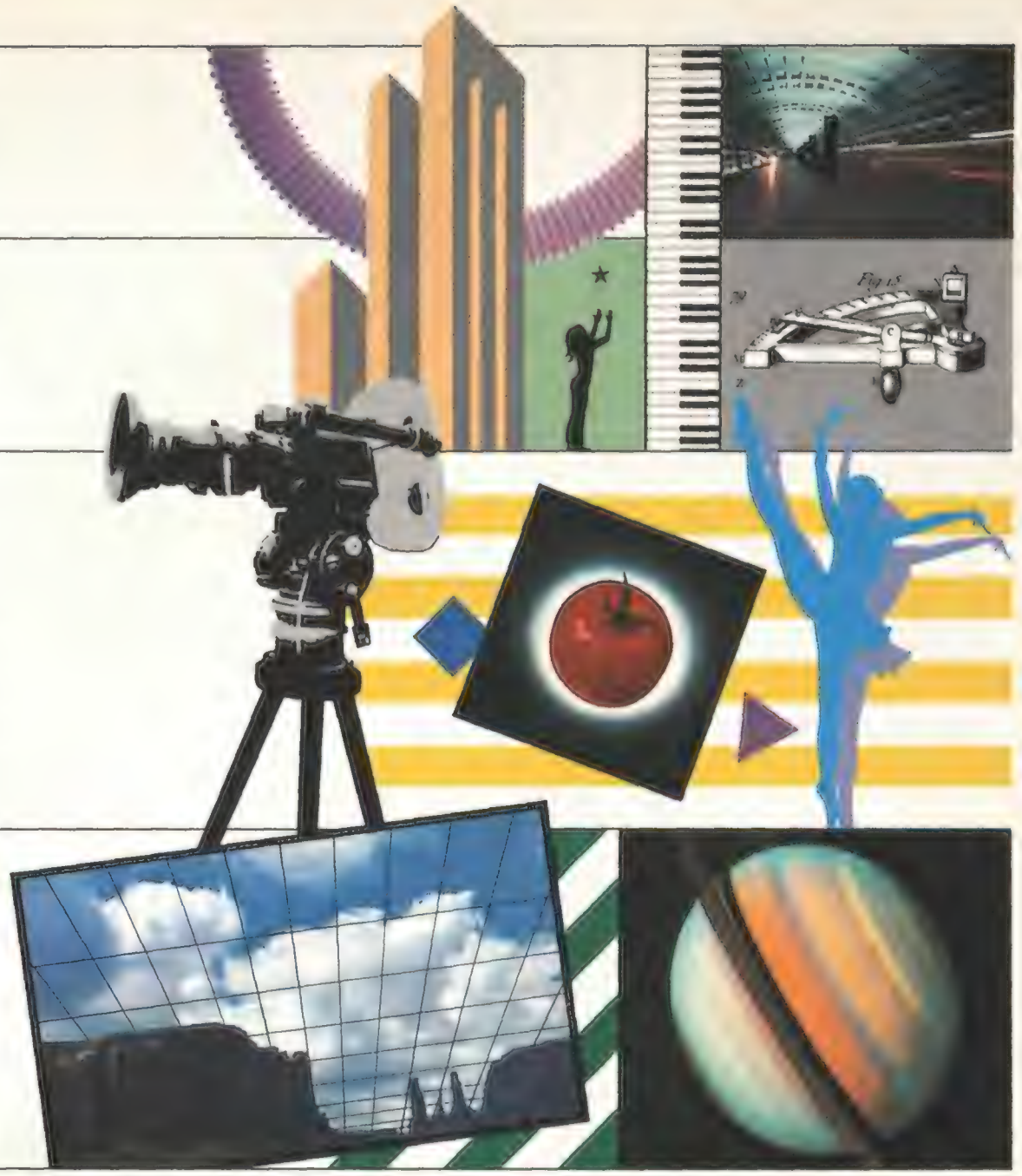

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Shirley Temple nestled up to "Uncle George" (Benchley) in *Kiss and Tell.*

highly successful, he gave up his writing career with sadness. He once told Dorothy Parker that each person became the thing he most despised, and now it seemed he was doing that very thing. Nathaniel wrote about a confrontation between his father and Robert Sherwood at a Hollywood party: "At one point, late in the evening, Benchley was heard to say, 'Those eyes—I can't stand those eyes looking at me!' Everybody stopped and turned, and saw that Benchley was backing away from Sherwood. They waited, already smiling and set to laugh at the joke that was about to come, but Benchley was serious. He pointed at Sherwood and said, 'He's looking at me and thinking of how he knew me when I was going to be a great writer . . . and he's thinking now look at what I am!' "

Benchley lived in Hollywood, making shorts and playing character parts in about 40 feature films. He also published some books of short pieces, such as *Inside Benchley* and *Benchley Beside Himself*. But his new career was still not satisfactory to him. As Nathaniel Benchley says, his father "didn't really want to be funny: what he wanted more than anything else was to be a good writer, and he was frustrated because the only way he could make money was as a comedian. He summed up his dilemma to Harold Ross, editor of *The New Yorker*, by saying 'I am not a writer and not an actor. I don't know what I am.' " One of his major ambitions was to write a history of the Queen Anne period; for years he collected books to be used as source material for his proposed work. But Benchley no longer seemed to have the energy for creative work, and as Nathaniel wrote, "it depressed him that he no longer seemed to care. The sleeping pills that he took at night kept him awake and the Benzedrine that he took on the movie lot made him drowsy, and he finally gave up taking the Benzedrine because he could think of no particular reason for wanting to stay awake anyway."

When he died in 1945 of a cerebral hemorrhage, his friends held two separate memorial services—one in New York at "21," the second at Romanoff's in Beverly Hills. They were the kind of wakes he would certainly have wanted. For when the humorist George Ade died many years before, Benchley is said to have remarked, "When a great humorist dies, everybody should go to a place where there is laughter, and drink to his memory until the lights go out."

Benchley enjoyed relaxation on Santa Catalina Island, not far from Hollywood.

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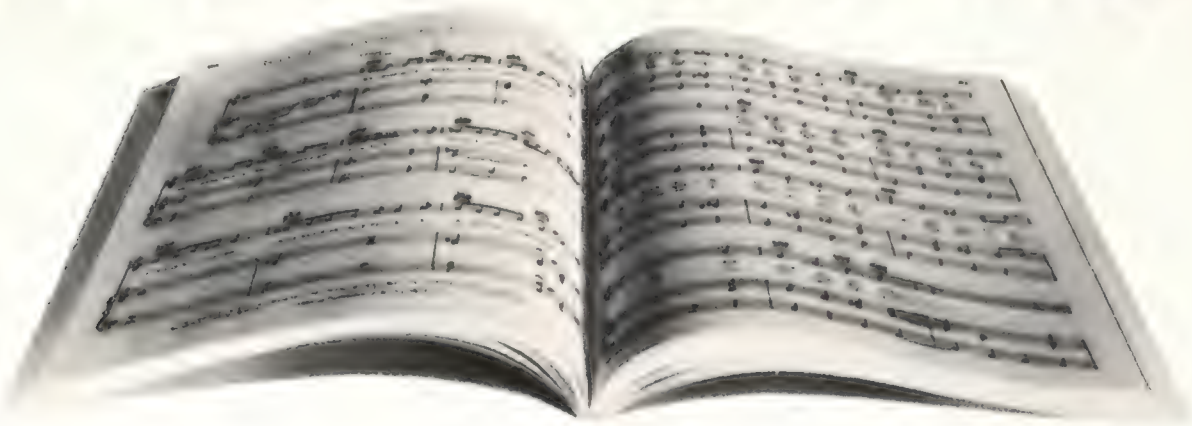

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Book Reviews

The Audubon Society Field Guide to North American Butterflies
Robert M. Pyle
Alfred A. Knopf, $11.95

There exists such a spate of field guides these days that the publication of yet another must be welcomed with only one outstretched arm (the other hand still on one's wallet). However, in the case of North American butterflies, there have been, until now, just three well-used guides: one by Klots (in the Peterson field guide series); a smaller one by Mitchell and Zim (in the Golden Nature Guide series); and the Ehrlich guide. In several respects, this new offering from the Audubon series surpasses its predecessors in coverage, utility and design.

The most striking feature of this guide is its glorious color photographs of some 600 species, often showing both dorsal and ventral wing patterns. Too often the earlier guides showed only the dorsal side and the reader had to consult the description of the species for other important details. Almost all the photographs in the guide are sharp, well-lit and detailed views of the butterflies. Nearly all are shown alive in their natural habitats, though some, like the Dogface and female Diana butterflies, appear to be dried and mounted specimens. It's a disappointment to see these few posed specimens.

Also included are 39 photos of caterpillars, 30 of chrysalides, and a dozen of eggs. This section is not an attempt at exhaustive treatment, but rather tries to give a basic sense of butterfly cycles and the diversity of egg, caterpillar and chrysalis colors and shapes.

The skippers, a primitive group of butterfly-allies, are treated by Pyle in de-

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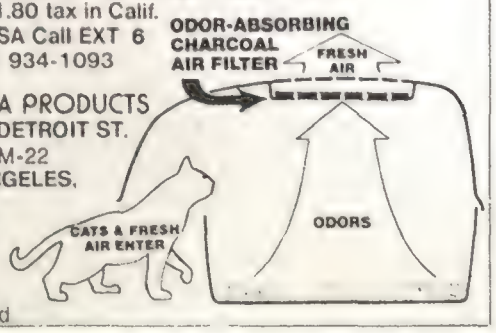

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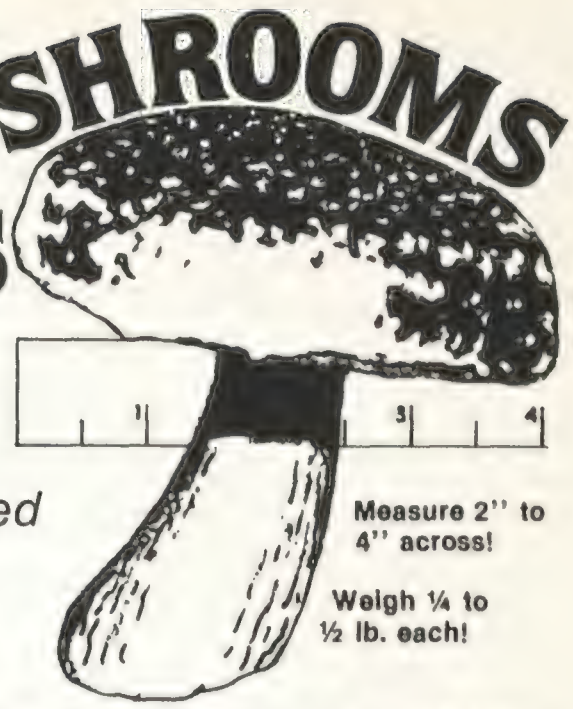


the majestic Shiitake mushroom - revered by gourmets for its flavor, revered in the Orient as the Elixir-of-Life

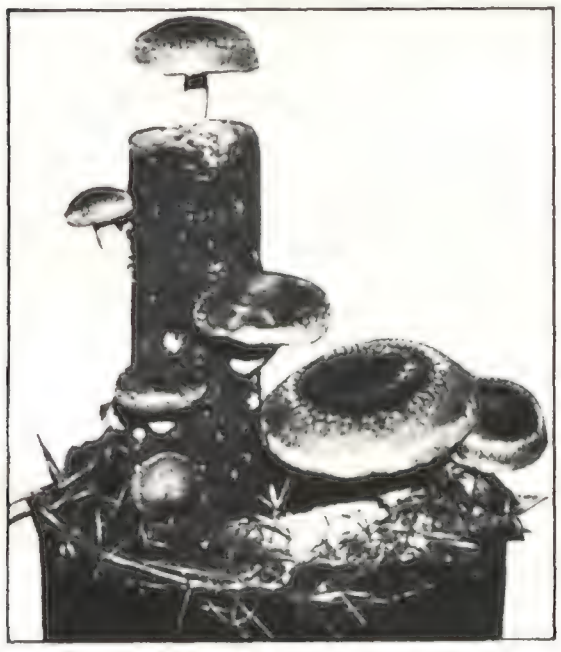
by Hal Taub (At Lovin' Spoonful, I'm Chief Cook & Bottle Washer)

Like most Americans, I love mushrooms. Mushrooms on steak...in an omelet...stuffed mushrooms...as part of my salad...mushroom gravy—you name it, I eat 'em up.
When I can afford it!

With the price of mushrooms *mushrooming* to over $2 a pound for the small button type—when you can find them—and the fancy dried imported kind going for $20-$40 a pound and more, I think twice before indulging myself. Is it any wonder that I've even tried growing them myself? What I got for my labors was a handful of tiny buttons, along with some nasty comments and dirty looks from my neighbors. (Our American or "button" mushrooms require large amounts of manure to grow.)

A TASTE EXPERIENCE

Do I love my food? Let's just say that I very seldom miss a meal. Recently, on a business trip to California, I was treated to a business lunch at an absolutely delightful restaurant in Beverly Hills. Of course I ordered a mushroom salad. It was incredible! I had never tasted anything like it before. Not even the imported mushrooms came close. I can only describe the flavor as being somewhere between filet mignon and lobster! I not only ate my salad, I ordered two more to boot. In fact I almost OD'd on mushroom salad!



THEY ARE CALLED SHIITAKE'S

That was my introduction to the Shiitake Mushroom. Let me tell you, I did not leave that restaurant without learning their source. I discovered they were being raised in very limited supply by a Chinese American botanist, Dr. Henry Mee. I called Dr. Mee thinking I could tote a few pounds home with me. He most graciously invited me out to his facilities. I went to buy mushrooms, but instead, received an education.

ELIXIR OF LIFE

The first Shiitake spawned during the misty era of a hundred million years ago. Early chinese sages attributed great powers to the Shiitake and it was often called the Emperor's Food. In ancient China and Japan, it was eaten by royalty to fend off old age, revered as an aphrodisiac and fought over by Japanese warriors who fiercely guarded the growing sites.

In their natural habitat, it takes two years to bring a Shiitake crop to harvest. They grow on oak logs in the remote mountain forests of Japan. After 25 years of study and labor Dr. Mee has developed a method that cuts the time down to 45 days. He now produces some 100 pounds daily, of which the entire crop is taken by a relatively small handful of gourmet restaurants and shops.

MORE THAN I BARGAINED FOR

Rather than sell me a few pounds of mushrooms, Dr. Mee suggested I grow my own. He had perfected his process to the point where he claimed anyone who could water a house plant could enjoy fresh, luscious "Shiitake" mushrooms. Simply stated, he simulates their natural habitat by producing a "log" fabricated of 100% sterilized organic plant material, with nothing artificial, and no chemicals added. The log is then innoculated with pure culture of the "Shiitake" mushroom spore...and then cured or "aged" to hasten fruition under home environment with the addition of nothing but water. When Dr. Mee said I would not require any manure or fertilizer of any kind, I decided to give it a try.

SIMPLE AS A.B.C.

The instructions were simple. Start by soaking the log in water for 24 hours. Then simply place the tree in its own wooden planter-stand and set on a foam rubber pad, which is supplied with each log and acts as a moisture "reservoir". After that just mist it once a day. And, unlike buttons, Shiitakes thrive in daylight.

INCREDIBLE RESULTS

In only 5 days I actually saw mushrooms start budding, 10 days later I picked my first giant Shiitake. One month later I had enough for not only myself but my friends as well. What's more, Dr. Mee has informed me that I can expect the log to keep producing for the next 10 to 12 months. If you're growing more mushrooms than you can use, simply store the tree in the frig (or outdoors if the weather is cool) and it will stop growing. When you want more mushrooms, just place it at room temperature and it will start producing.

NUTRITION

With a virtually unlimited supply of my favorite food I've become something of an expert. Mushrooms are nature's unique low cal fat-free food. One pound contains fewer calories than a single apple! Shiitake mushrooms have more than twice as much protein and fiber as common button mushrooms, almost 3 times the minerals. Calcium, Phosphorous and Iron are present in large quantities, as are high levels of B Vitamins and Vitamin D2.

A FEAST

All of this nutrition stuff is great. But the eating is even better! One ounce of Shiitake will equal the flavor of an entire pound of buttons. They are super meaty, super mushroomy in taste, succulent, heady and 100% edible from cap to stem.

One of two slices turn an ordinary pot roast into a gourmet delicacy...an ordinary salad into an extraordinary taste sensation...a gravy into a nectar for the gods. And spaghetti; let me tell you about my spaghetti. I serve it with a mushroom meat sauce that is truly memorable!
My guests insist that Julia Childs had come in to cook for me!

AM I SELFISH?

My friends (and my wife) have accused me of being selfish. I admit to being somewhat of a miser when it came to sharing my mushroom crop. It seems every time I gave my friends a super-size Shiitake, they would come back and pester me for more. I finally had to ask Dr. Mee for additional mushroom logs to save my sanity and several valued friendships.

Dr. Mee is now producing a limited number of Shiitake Mushroom Log kits. We at the Lovin' Spoonful are fortunate in being chosen to introduce it to the general public. As a measure of our enthusiasm and our confidence we offer it to you at our risk. If the Shiitake is not every bit as delicious as we claim, or for any reason, you are not satisfied with the production of the log, return it for a full refund of purchase price. The cost is only $19.95, complete with everything you need to grow a bumper crop. We also include a selection of fabulous mushroom recipes. I guarantee it will be the most delicious investment you will have ever made.

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tail, contrasting with the attitude of some previous guides, which give them short shrift. (Klots actually gave skippers more detailed treatment, but only covered those in Eastern North America.) More than 170 full-color photographs of skippers are included, which is valuable because their many subtle shades of brown are often completely lost in black and white illustrations or photos. However, the male and female of the same species are often not shown on the same page, a small inconvenience in the field.

The 759 semiglossy plates in this compact guide are followed by more than 500 pages of species descriptions, with concise

West Virginia White butterfly (*Artogeia virginiensis*) appears in Audubon guide.

details of life cycles, larval host plants, flight periods, preferred habitats and geographic ranges. It is unfortunate that, as in other Audubon guides, no range maps are provided. (In this regard, the little Golden Guides surpass all others.) The space allotted to wordy range descriptions could be more effectively used to accommodate simple line maps, so that the reader might see, at a glance, which species to expect in a particular area.

In most other respects, however, the publishers have gone out of their way to help the reader. The photos are keyed by shape and color, rather than taxonomically. (This probably infuriates taxonomists but the rest of us are grateful for the crutch!) However, the lack of scientific names on the plates is a drawback for the professional user. Only common names are given, many of which have been newly coined for this book. These common names don't provide the information about a butterfly's generic relationships that is a built-in part of the scientific names. Some argue that to youngsters or other newcomers, scientific names pose a hurdle; others say this is hogwash.

There is a full index to both scientific and common names, as well as a separate one for the plant species eaten by the

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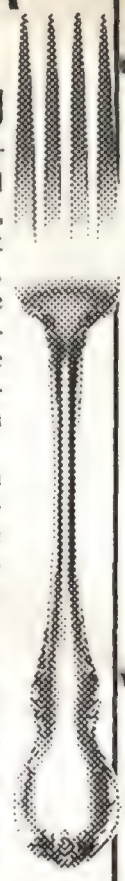

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caterpillars. A glossary to specialized terms in lepidopteran biology, ecology and botany will be particularly helpful to the nonprofessional reader.

James A. Cohen
Zoologist, University of Florida

The Enchanted Loom
Robert Jastrow
Simon and Schuster, $13.95

The Enchanted Loom starts with a bang—the big one—and ends in the velvet cosmos of the future with science-fictionlike computers tumbling off toward the stars. In between, Robert Jastrow elegantly guides us through the evolution of human intelligence and the projected development of computer intelligence.

Of course, this is the kind of writing we have come to expect from Robert Jastrow, who's been called "the greatest writer on science alive today." As well as being the founder of NASA's Goddard Institute for Space Studies, Jastrow is Professor of Astronomy and Geology at Columbia, Professor of Earth Sciences at Dartmouth and author of a number of books on the solar system. This is the final book of his trilogy that began with *Red Giants and White Dwarfs* and *Until the Sun Dies.*

The Enchanted Loom garners its title from a quotation by Sir Charles Sherrington: "It is as if the Milky Way entered upon some cosmic dance. Swiftly the brain becomes an enchanted loom where millions of flashing shuttles weave a dissolving pattern, always a meaningful pattern though never an abiding one; a shifting harmony of subpatterns."

The pattern is woven in a discourse that encompasses and hands out cosmological grandeur in simple sentences—"Around some stars, planets formed." From the stirrings of life through the dinosaurs and night mammals to the apes and Neanderthals, Jastrow patiently, eloquently explains. The fossil record is imaginatively fleshed out and each step of the way the brain grows in size and complexity.

Later chapters explore the evolutionary adjustments that probably contributed to brain growth. In one, "Thinking in the Dark," Jastrow seeks the roots of the "smell brain": "Why were the first mammals brainier than their dinosaur contemporaries? . . . The answer is probably connected with the nocturnal lifestyle of the mammal, and with the fact that it used the senses of smell and hearing for

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survival, rather than the sense of sight."

The deep core of the mammalian small brain developed a thin coating of gray matter called the neopallium or "new cloak." In 100 million years or so this became the large human cerebral cortex—the convoluted gray mass that headquarters our circuitry.

Jastrow points out that living "gray matter" is really lavender or pink and is only gray in dead brains. The human brain weighs an average of three pounds and "contains 10 billion neurons and 100 trillion" circuit connections. Seventy percent of this circuitry is in the cerebral cortex, which holds "the higher centers of abstraction, planning, memory, language and learning."

Representing late tree-dweller evolution, tarsier has improved vision, small nose.

This book goes on to map the working similarities of the brain and the computer. The basic logical steps in both mathematics "and all reasoning," the author writes, are "surprisingly simple. The most important ones are called AND and OR . . . . These lines of reasoning are converted into electrical circuits by means of devices called 'gates'. In a computer the gates are made out of electronic parts—diodes or transistors. In the brain of an animal or a human, the gates are neurons or nerve cells. . . ."

Brains and computers, Jastrow says, are turning out to be "more alike than anyone would have believed a few years ago. Each is a thinking machine that operates on little pulses of electricity traveling along wires." The latest developments in

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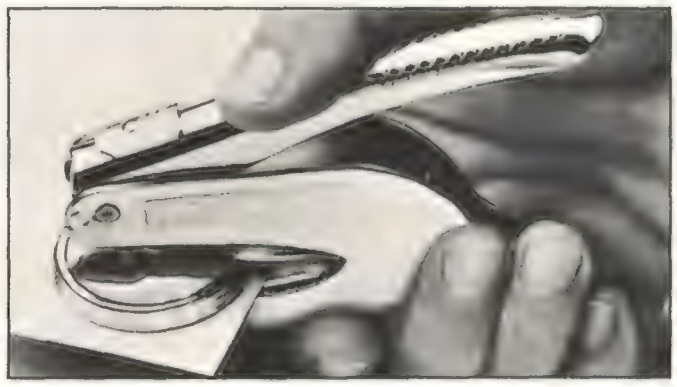

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computer technology—mainly the capacity to crowd more elements onto the surface of a chip—have opened new vistas for computers. "Chips are like the neurons in a human brain; wired together in great numbers, they make up the modern electronic brain."

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The author goes on to predict an even more "fateful step of uniting mind and machine" when "At last the human brain, ensconced in a computer . . . could leave its parent planet to roam the space between the stars."

Carrol B. Fleming
Marine biologist and science writer

The Woman That Never Evolved
Sarah Blaffer Hrdy
Harvard University Press, $17.50

Darwin's first great book was *On the Origin of Species*. His second was *The Descent of Man*. And there, in a nutshell, suggests sociobiologist and feminist Hrdy, is the problem with much of evolutionary biology. Scientists have essentially ignored the descent of *woman*, and particularly the influence of female human nature on both the survival of the species and the character of present-day women.

Two major themes have dominated evolutionary thinking about women: the biological idea that females hardly matter and the sociological idea that they used to matter but don't any more. Given Darwin's doctrine of fitness based on competition, the supposedly passive, noncompetitive, motherly females of the various primate species appeared unable to influence the direction of evolution. Given Engels' doctrine of a primordial matriarchy overthrown in deep prehistory, the "gentler" sex appeared irrelevant to the development of the human species or society. But, as Hrdy persuasively argues, these ideas are at odds not only with each other but with logic and fact. How could so passive a creature ever have dominated? Why should so dominant a creature have been so decisively overthrown? The answer is simple: neither idea accu-

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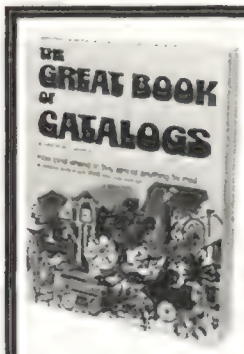

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rately reflects the condition of the females.

To get some idea of that condition, Hrdy introduces us to the females of our far-flung evolutionary family, the primate order. Though all these distant cousins have themselves evolved in the years since Homo sapiens emerged, some of them may well reflect the evolutionary pressures that our own distant ancestors underwent. And family resemblances are always instructive. We tour a number of different forest, desert, jungle and plains habitats that support modern primates and that resemble those our own ancestors may have passed through.

We meet a startling variety of different creatures making their livings and organizing their lives in remarkably different ways. Primates live as old married couples, as harems of unrelated wives ruled by a potentate, as clusters of kinswomen serviced by a sequence of transitory lovers, or as virtual hermits given to occasional one-night stands. Just about the only thing these diverse females all do is compete relentlessly, all their lives, for survival, for social advantage, and for the welfare of their young.

They don't, however, compete in the flashy fashion of males, and the very subtlety of female competition may explain why scientists missed it for so long. Females rarely come to blows over who gets to mate. They hardly ever kill the offspring of rivals. But compete they do, sometimes with an indirection and determination that Jane Austen would have admired. Feminine struggles for social status, observed in a number of species, are not the frivolous stuff of the society pages, Hrdy maintains, but rather they are serious attempts to secure the welfare of the young.

Hrdy considers other features of femininity as well, including the feminist's cause célèbre, the meaning of orgasm. These explorations are often intriguing, sometimes illuminating. Unfortunately, however, she frequently tumbles into the trap lying open for the unwary sociobiological writer: the combination of teleology and anthropomorphism that seems to make animals masters of their own evolutionary fates.

Fitness is a statistical expression, not a psychological motivation. Hrdy seems to suggest, for example, that knowledge of paternity influences the behavior of male primates. They may possess physiological mechanisms that produce this impression,

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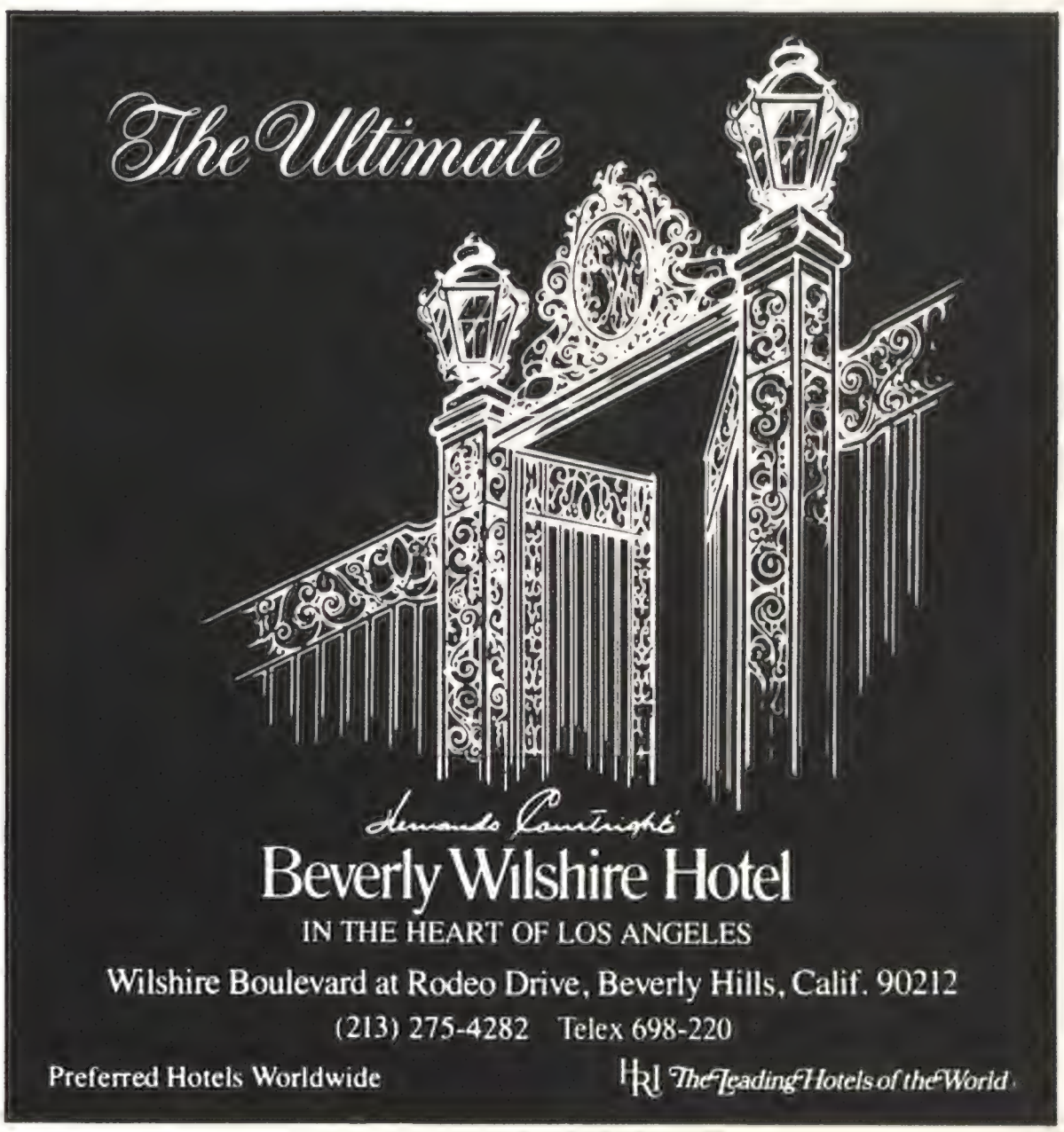
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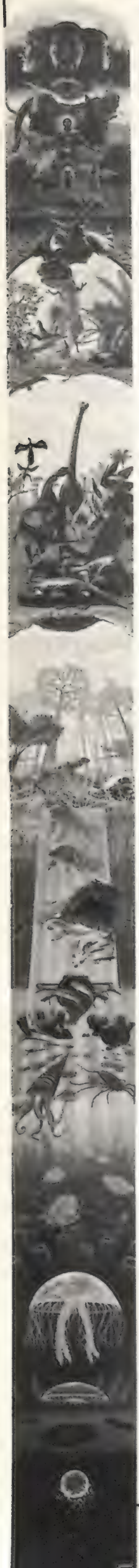

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but surely she can't mean that apes have made the logical leap from intercourse to paternity, a connection that eludes not only adult members of some primitive societies, but many hapless American teenagers as well.

Beryl Lieff Benderly
Co-author of *Discovering Culture,*
Author of *Dancing Without Music*

Self and World: An Explanation of Aesthetic Realism
Eli Siegel
Definition Press, $17.95

Back before his name acquired common-noun status, Marshall McLuhan had some difficulty publishing his book *Understanding Media.* One publisher said, "We only do books that are ten percent new; this is 75 percent new."

Definition Press of New York has done the bold and necessary thing in publishing a book that is new—revolutionary—on every one of its 400 pages, even as it is solidly in the tradition of inquiry begun by the ancient Greeks. Eli Siegel's *Self and World: An Explanation of Aesthetic Realism* is that book. Praising Siegel's poetry in 1951, William Carlos Williams wrote, "We are not up to Siegel even yet. . . . But at last I am just beginning to know, to know firmly what the present day mind is seeking." Of everything Siegel has written (and the number of works in poetry, literary criticism and Aesthetic Realism is large), this book, written between 1942 and 1946 and updated until his death in 1978, is the hardest to be up to and the most worth trying to be. It is not hard to read; the prose is fresh and clear. It is hard because it calls for more fairness to all reality than has been demanded before.

The thesis of the book is fourfold: (1) that the most critical thing in a person's life is his attitude to the whole world; (2) that a person's deepest desire is to like the world on an honest basis; (3) that all disorders of mind—from everyday boredom to insanity—arise from contempt for the world, the lessening or dismissing of the outside world in order to be superior to it; and (4) that sanity and good sense, in love and in medicine, in an individual as well as in an economic system, are arrived at through esthetics. And this is not the customary idea of esthetics: it is a living, breathing, rugged way of seeing the whole world, from a matchbook to a mother-in-

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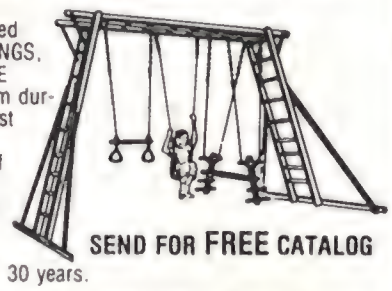

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law, as being composed of opposites in a relation making for beauty.

In essence, *Self and World* and the doctrine of Aesthetic Realism are saying that the only way to like yourself is to like what's not yourself, and the only way to like what's not yourself honestly is to do all you can to see it the way an artist sees his subject—that is, as a oneness of esthetic opposites. All the arts and all the sciences, says Siegel, are at once the evidence of Man's hope to like the world and the basis on which he *can* like it through knowing it.

Whether child or adult is spoken of, this book sees a person's concerns with dignity and compassion. Take the matter of guilt, for example. In *The Ego and the Id* (1923), Freud calls guilt a tension between the ego and the ego-ideal, an expression of condemnation of the superego, which in some individuals is intense and cruel. Erich Fromm in *The Heart of Man* (1964) calls guilt an aspect of self-loathing and sadness which anyone hoping to love life should shun. R. D. Laing in *Self and Others* (1969) distinguishes true and false guilt, one arising from the obligation to be oneself, the other from the feeling of not being what others wish one to be.

Siegel says that guilt is the world in a person, criticizing him for the best of reasons: so that he can change. "In every instance of a guilt feeling, there is evidence pointing to the fact that the cause is *a feeling of separation of oneself from reality as a whole*," Siegel says. Guilt, which is self-criticism, can change to anger as a means of directing the criticism away from self; it can change to fear because a world one has separated oneself from is hard to see as friendly. In any one of its forms, guilt can be used to see where a person has not been fair to outside reality.

Of all the statements in *Self and World* concerning the welfare of mind, clearly the boldest is this: contempt causes insanity. Siegel comes to this conclusion in the long preface that updates the book and confirms the author's earlier ideas based on 30 years' experience. Siegel taught Aesthetic Realism steadily over all those years and learned from everyone he spoke to.

This book invites a workout from any reader.

Linda Ann Kunz
English instructor, School of Visual Arts, New York City

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Additional reading

Rockefeller Wing (p. 38)

For Spirits and Kings: African Art from the Paul and Ruth Tishman Collection, edited by Susan Vogel, The Metropolitan Museum of Art/Abrams, 1981

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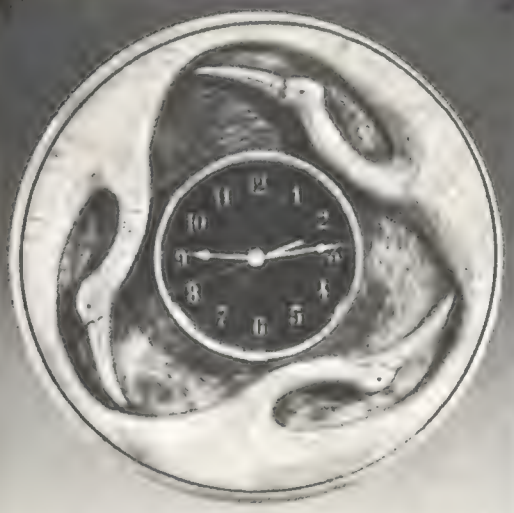

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Smithsonian highlights

It was FDR in January and now it's George Washington, being honored in Smithsonian museums (and SMITHSONIAN, p. 74) because he was born 250 years ago. Also honored with openings this month are pilot Jacqueline Cochran, old architectural drawings, 20th-century art and paintings of orchids that bloom in the Smithsonian greenhouse.

Special February events

National Air and Space Museum
Jacqueline Cochran: World Record Holder (February 11-August 1983) Surveys remarkable 40-year career (p. 159).
Space Shuttle: From Earth to Orbit (February 3, 8 P.M.) Lecture.
Reflections on the Discovery of Pluto (February 17, 7:30 P.M.) Lecture.
Star Names and Star Pictures (February 6, 9 A.M.) Monthly sky lecture.
Free Space Films (Fridays, 7:30 P.M.).

National Museum of African Art
Life . . . Afterlife: African Funerary Sculpture (through March 1).
Lay This Body Down: Continuities in Beliefs and Practices in the African Diaspora (February 28, 2 P.M.) Discussion.

Cooper-Hewitt Museum (New York)
Architectural Fantasy and Reality (February 16-May 2) Late-17th- to mid-18th-century entries in Rome competition.
Robert Adam and His Style (through April 11) Drawings, furniture and silver.

Anacostia Neighborhood Museum
Mary McLeod Bethune and Roosevelt's "Black Cabinet" (through May 3) Story of this charismatic black administrator.

Hirshhorn Museum & Sculpture Garden
Five Distinguished Alumni: The W.P.A. Federal Arts Project (ends February 22).
Metaphor: New Projects by Contemporary Sculptors (through February 28).

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National Museum of American History
G. Washington: A Figure Upon the Stage (February 22-January 11, 1983) Anniversary exhibition (p. 74).
Franklin Delano Roosevelt: The Intimate Presidency (through August) Focuses on his techniques of communication.
General von Steuben: A Secret Aid to the Americans (through April 18).

National Museum of Natural History
Orchid Paintings by Regina O. Hughes (February 13-April 11) Specimens from the National Orchid Collection (below).
Life on Earth Acclaimed BBC evolution films; for schedule call 357-1756.

National Museum of American Art
Recent Trends in Collecting: 20th-Century Painting and Sculpture from the NMAA (February 5-March 21).
Roosevelt's America: New Deal Paintings New exhibit reflects social concern.
Recent Acquisitions: Prints, Drawings and Watercolors (through May 16).

Regina Hughes' *Dendrobium* "blooms" at Museum of Natural History.

National Portrait Gallery
An American Icon: The 18th-Century Image of George Washington (February 22-April 27) Prints of Washington as seen by his contemporaries.
FDR: The Early Years (through June 27).
Carl Schurz: America's Teutonic Reformer (through July 18).

Freer Gallery
Japanese Prints (through February 28) Delicately colored woodblock prints from the Edo Period (1615-1868).

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Elijah Pierce: Messages in Wood (through February 28) Panels, mainly of religious themes, by this Ohio woodcarver.

Smithsonian Events

For price information and tickets to Resident Associate events, call 357-3030:
From Private Treasure to Public Pride: The Evolution of the Art Museums of Europe (February 6) All-day seminar.
Taste of Old London (February 17, 7:30 P.M.) Lecture and reception.
Artists and "the Others" (February 17, 6 P.M.) Talk by art critic Dore Ashton.
The Adams' Gothic Castles (February 25, 8 P.M.) Alistair Rowan on architecture.

For information and tickets to Division of Performing Arts events, call 357-1500:
Poetry of the Blues (February 5, 6) Concerts and workshops on Black American blues (call 287-3391 for schedule).
A Parisian Concert Spirituel (February 8, 8 P.M.) Chamber music and song.
Jazz Weekend (February 19-21) Features Art Blakey & the Jazz Messengers, Art Farmer, Joe Williams, Mel Lewis and the Jazz Orchestra.
Don Reno & The Tennessee Cut-Ups/ Ralph Stanley & The Clinch Mountain Boys (February 28, 8 P.M.) Banjo.
Khmer Classical Dance Troupe (February 13, 8 P.M.) For information call 287-3438.

Radio Smithsonian

A musical review featuring some oldtimers, a musical tour of the Pacific, African funerary sculpture and ancient monuments of Egypt are among the programs broadcast nationwide this month on Radio Smithsonian. To find out which stations carry these programs, write: Smithsonian Office of Telecommunications, A&I 2472, Washington, D.C. 20560.

Membership benefits

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Los Angeles (February 1-April 30) *Ice Age Art*, Los Angeles County Museum of Natural History.

Littleton, Colorado (January 23-February 21) *The Contemporary American Potter*, Arapahoe Community College.

Springfield, Missouri (January 30-February 28) *World Print III*, Springfield Art Museum.

Camden, New Jersey (January 23-February 28) *Berlin Porcelain*, The Campbell Museum.

Cincinnati (February 6-April 14) *Renaissance of Islam: Art of the Mamluks*, Cincinnati Art Museum.

Pittsburgh (February 27-March 28) *Pressed On Paper: Fish Rubbings and Nature Prints*, Carnegie Museum.

Lubbock, Texas (February 27-March 28) *John Sloan in Santa Fe*, Texas Tech.

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Highlights continued

Edward Curtis and "his" Indians

New exhibit looks at manipulations and retouching, asks how much truth the famous photographs show

Does the camera lie or, more precisely, do Edward Curtis' acclaimed photographs convey an erroneous image of North American Indians in the early 20th century? A fascinating SITES exhibit, "The Vanishing Race and Other Illusions," opening March 3 at the National Museum of Natural History, shows evidence of various manipulations in the romantic works that gave Easterners a glimpse into Indian life.

Curtis called his work "art-science." His nearly 30 years in the field culminated in the 20-volume *North American Indian*; a complete set sold recently for $73,000. The mammoth collection is considered a landmark documentary of Indian tribes. But is it?

Writes exhibition curator Christopher Lyman in his book on the same subject: "He *knew* that much of what he thought of as 'Indianness' did not exist, and in that knowledge, his work tended toward deception." Curtis is said to have promulgated the stereotype of the savage Indian, a member of a "vanishing race" succumbing (justifiably, thought Curtis) to civilization. Photos were retouched, costumes were provided and subjects frequently posed in outdated scenes. Curtis wanted to show the Indian before contact with white culture, but he was too late.

Carol Simons

Curtis' original photograph, *In Piegan Lodge* (left), includes clock, missing from gravure (right), altered in effort to portray Indians before white contact.

Curtis' *Upshaw-Apsaroke* (left) was taken seven years *after* F. A. Rinehart's *A. B. Upshaw*—the same man in his more usual dress.

Photos of two Oto Indians show same headdress, not typical of the time.

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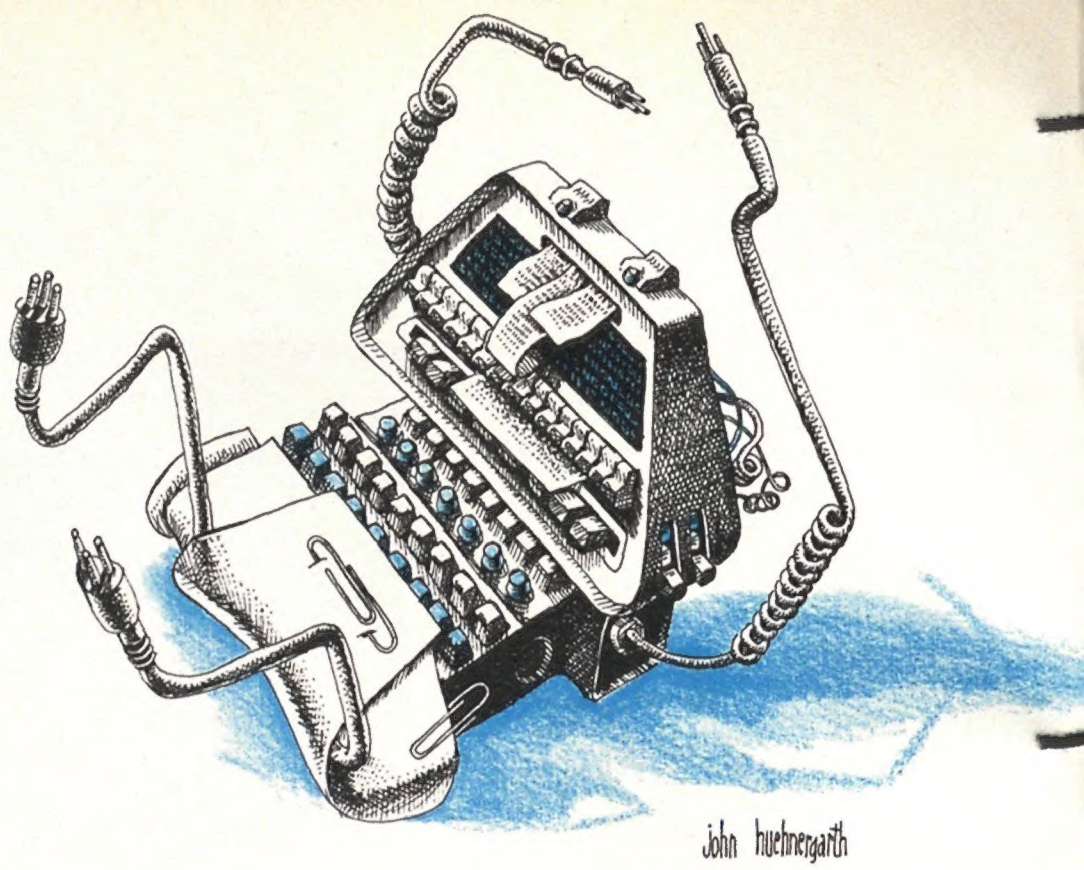
By Ann H. Zwinger

Becoming mom to an infant word processor



A decade ago I graduated to an electric typewriter which, since I type my own manuscripts, was a godsend. Within the last year, however, I found myself with two books to finish almost simultaneously, and when my agent sent me an article about the growing number of writers using word processors, working with one seemed the answer to endless hours of arduous typing when you've just run out of available hours.

But becoming the mother of a word processor is not simple. It is like adopting a child. First there were preliminary interviews which, I suspect, may have indicated my fitness for leasehood, such as: Will this person be able to "think computer"? Will she take the time to train it in the way it ought to go?

After the order was placed (I refrained from saying I didn't care if it were a boy or girl), my workroom was checked to see if I had the proper environment for the new infant. My work desk had proper triple-pronged sockets, but cagily I did not let anyone see my pack rat's dream of a back room in which old and new manuscripts, shells and rocks, account book, index cards, unlabeled Diptera, *Gourmet* magazines back to 1970, and dictionaries all coexist in tottering equilibrium.

Finally the thing in question arrived. No young mother ever as proudly removed her first child from the hospital as I did the word processor from its packing, plugging numbered plugs into numbered sockets. When I turned it on the CRT (for cathode ray tube) hummed gently, a *most* satisfactory child.

But not the printer. The printer balked and I had to call the pedia—sorry, repairman—who spent almost a whole afternoon adjusting, tickling its rollers, and offering lollipops, until it, too, sprang into proper configuration with a triumphant whirl.

Then began the training period. Mine, not its. Immediately the inevitable occurred: a whole sentence simply kept spacing to the right, running down into the next line. And it simply would not come back. I chased it by cursor and by scatological comment. Neither worked. Finally I "thought computer." I won, but not without some scars on my ego.

I soon discovered that I simply needed to apply a little parental guidance and all would work well. When I requested "MOVE" it queried "MOVE WHAT?" and then "WHERE TO?" And when I chucked it under the cursor it made typing an uninterrupted flowing delight; it moved paragraphs, created intriguing juxtapositions, and even enhanced the opportunity for creative play. And, mirabile dictu, it even corrected my spelling!

The printer got clean ribbons when necessary and was fed paper when hungry. We developed a working relationship of considerable satisfaction to all of us. Or so *I* thought.

Then came growing pains. The CRT spit out petulantly, "Printer error, printer error!" And the other machine grated "Ratchety ratchety BLAT!" The CRT flashed accusingly: "Printer reprinting. Check output." So, I checked.

After that, the inevitable: adolescence. Having been through it with assorted children, I should have been prepared. But somehow one never is. The CRT took three chapters and ran. Absconded. Three hard-worked chapters. Gone into the ether.

And the printer. When I stood beside it, it behaved. But let me step out of the room and, like a greedy teenager, it stuffed paper into its roller as fast as it could. And jammed.

Well, what can you do but forgive, forget—and (sigh) retype? Hope your patience and forbearance will be rewarded? And at last I do believe I see signs of real maturity in the CRT. Giving a little. Seeing things my way once in a while. Not losing things so much. Growing up.

And just lately I've been able to fix a sandwich in relative serenity while the printer bleeps and burrs out Chapter 5. The CRT is even getting not to mind a little mayonnaise on its keys, and on arduous days, is not averse to a chocolate bar alongside.

I wonder: has anyone written a diet program for a matronly WP?

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